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Rubber Compounding Practice[1]

Ingredients for Economy, Processing, and Inflation

WEBSTER NORRIS

¶ The materials treated in this article are some of the oldest and commonest ingredients of the rubber industry.

¶ They are ordinarily unstandardized and used without much regard to choice for suitability in a given case.

¶ Thus employed, they may prove the reverse of economy, and unduly depreciate the quality of the goods, bringing loss to the manufacturer and poor service to the user.

THE essential features of cost, workability, and adaptation for service must be considered when planning mixings for rubber goods. The careful compounder selects ingredients judiciously according to function, balancing the combination for desired results.

All the materials included in this review are well known and used in diversified lines of rubber work, especially in mechanical rubber goods.

Diluents for Economy

The common diluent ingredients are barytes, whiting, and powdered slate. The first two of these have been used since the earliest days of rubber working. Powdered slate or slate flour is an introduction of recent years less generally used than barytes and whiting. If these materials are used in excess, the economy is often more apparent than real, because in reducing the pound cost of a rubber mixing, these materials inevitably raise the gravity of the mix and thus increase its volume cost, which is the true measure of its economy.

Diluents or fillers are chemically inert and, if not applied in excess, their presence may be beneficial by contributing the firmness requisite for good mixing, calendering, and ease of handling in the construction of rubber goods. The essential qualities of a satisfactory filler for rubber work include uniform degree of fineness and freedom from moisture, grit, or other foreign impurities. The specific gravity of these materials is always such that the powder cannot float about in the air at the mixing mill. The choice of a filler is determined chiefly on the score of economy for competitive work.

Barytes

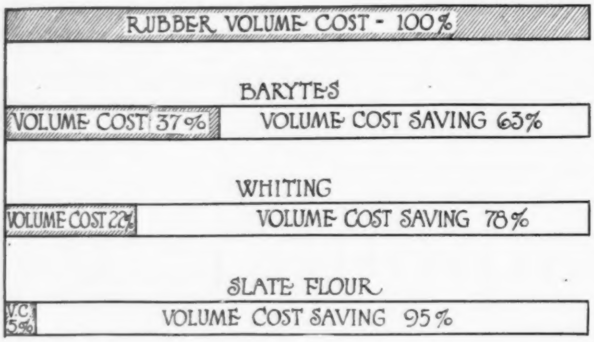
Barytes has been employed for rubber compounding from the earliest days because of its chemical permanence and smooth texture when suitably prepared. Numerous commercial grades of ground barytes are available, differing in degree of fineness and purity and in color variations from pure white to dark off-colored grades. The grades produced by grinding the natural mineral are: dry ground, off color, medium, pure white, and water floated.

Deposits of baryta ore are found in Georgia and Tennessee and minor deposits in some other southern states. Practically all southern barytes is dry ground. It is not so pure, white, or normally so finely ground as the Missouri barytes, which is considered the softest known, and is almost invariably water ground and floated. Ordinarily only one grade is manufactured and this is usually termed No. 1 Missouri barytes or No. 1 water ground and floated Missouri barytes. In the grinding operation some off-colored material is produced and this is sold as off-colored Missouri barytes. It is said that none of the Missouri stock is dry ground.

Water ground, chemically purified domestic barytes is produced by improved methods. The product is characterized

by soft texture and is standardized as to purity, color, fineness, and uniformity. It is manufactured by a process for complete removal of iron and the residual acid used in its extraction. The finished material will not discolor on exposure to the atmosphere nor be affected chemically by any other compounding ingredient.

Water grinding compared with dry grinding has the superiority of producing greater uniformity of fineness because the resulting particle sizes of the material are classified by a system of water flotation and settling. This step is followed by silk bolting the reground dried washed stock, thus completing the preparation of one of the oldest and most dependable rubber compounding ingredients and one that is regaining popularity in current compounding especially for tire and tube work.



Relative Volume Costs and Savings, Rubber = 100 Per Cent

German and Belgian barytes imported for the rubber trade is similar to the Missouri stock in color but not so soft in texture.

Blanc fixe or chemically precipitated barium sulphate is a by-product in the manufacture of hydrogen peroxide, etc. It is softer and of finer particle size than ground barytes. It is used in inner tubes and other high-grade molded pure gum articles to which it contributes facility in machine processing.

Whiting

Whiting is the oldest and most important inert filler. The original whiting is ground chalk, calcium carbonate, from the chalk deposits of England, France, and Belgium. Today, ground crystalline whiting is prepared from pure white limestone and by-product whiting from the paper-making industry. Both of these sources produce whiting differing in texture and color from chalk whiting although all would be called white.

Chalk whiting has a slightly yellowish tint, and is very soft. Crystalline whiting is the purest white of the three kinds but has "short" or hard texture. By-product whiting is whiter than the chalk grades and not so "short" in texture as the crystalline.

Chalk whiting is manufactured in six grades: (1) commercial; (2) putty; (3) washed; (4) gilders; (5) extra gilders; (6) Paris white. Crude chalk is imported in rough broken form in bulk as ship's ballast. Owing to its origin, numerous nodules of flint are scattered through its mass. These are removed either by breaking up the chalk with hammers and removing the flints by hand or by passing the chalk through crushers and removing the flints by hand from picker belts before feeding the chalk to the grinders.

The commercial grade is simply dry-ground, air-floated chalk. Putty grade is dry ground and bolted. All of the other grades are produced by wet grinding, floating, and grading by settling. The process is briefly as follows: The chalk, after elimination of flints, is fed to wet grinding mills, flowing thence to classifiers which discharge the silica and oversize to waste, and overflow the fines to thickeners. The thickeners settle the fines to a sludge containing about 50 per cent moisture. This sludge is then pumped to filters where the moisture content is reduced to about 25 per cent. It is then conveyed by spirals into rotary driers which reduce the moisture to less than ½ per cent. The whiting is passed next through a disintegrator for the reduction to a powder of any lumps which may have formed during drying. This completes the manufacturing process and the only remaining operation is the packing in bags and barrels by automatic packers.

To maintain a uniformly white color, it is necessary to select the best grade of raw material, grind thoroughly, and classify at a rate which will insure the removal of silica and other foreign material. Uniformity of fineness is maintained by a constant rate of feed of water and chalk to the grinding mills and a constant speed of the classifying machines.

The wet-process chalk whiting grades downward in particle size from washed, gilders, and extra gilders to Paris white or finest. No grade coarser than gilders is suited for thin calendered sheet, high quality tubing, and other fine work. Typical examples are shoe uppers, extruded tubes, proofing, knife or die-cut work, and goods used under inflation.

Ground limestone or crystalline whiting is the variety of whiting most recently introduced for rubber compounding. It is produced from crystalline white lime rock by grinding and water floating and may contain silica or clay as impurities. Its texture is gritty owing to the angular form of its particles and the presence of silica.

A simple test for comparing the relative fineness of whiting and other pigments can be made by rubbing a little of the dry material between the thumb-nails. This test will doubly reveal the presence of grit in the slightest amount, first, by the sense of touch and, second, by dulling the polish of the nails. This method is preferable to testing for grit between the teeth since it is applicable to ground material of all sorts whether toxic or not and affords ocular evidence of the presence of grit.

Crystalline whiting is not adapted for calendered and fine tubed work, proofing, inflated goods, nor such as are flexed or distended in service, because of the cutting effect of its sharp particles. It is, however, very well suited for many mechanical rubber goods, molded articles, etc.

By-product whiting is produced in paper making, the manufacture of caustic soda from sodium carbonate and lime, and the manufacture of magnesium carbonate from magnesite or dolomite rock. It was introduced for rubber compounding as "Alba White." It has a dry feel and the tendency of its particles to agglomerate causes it to mill less readily into rubber than the other sorts of whiting. It possesses mild alkalinity, which should not exceed ¼ per cent in order that it may not cause bad aging, which is a pronounced effect of alkali in overcured goods. By-product whiting is interchangeable with limestone whiting for the same purposes.

Ground slate or slate flour is made from waste slate rock. Geologically it is indurated impure or off-colored clay and has the same gravity. It is dark gray or reddish in color and is suited only for heavy cheap mechanicals in which quality is not essential. In goods trimmed by knife or cut by die the cheapness of slate flour is no recommendation because its presence rapidly dulls the edge of any cutting tools.

Dusting Powders

Broken-down crude rubbers, reclaims, freshly milled batches, and uncured scrap from calender, tubing, and cutting departments, and making-up rooms, are always dusted with inert powder to prevent adhesion into unwieldy masses in the storage bins. Dusting also prevents contami-

nation with bits of stray foreign matter otherwise liable to adhere to raw rubber surfaces.

Frequently, any inert powder is considered suitable for this purpose, and the cheaper the better. That view leads to false economy especially where low-grade and gritty material is dusted on high-grade stocks intended for smooth calendered work or pneumatic goods. Even after dusting with suitable powder, stock for fine work should be protected by covering it with clean sheeting while in storage. Neglect of these precautions leads to the presence of grit and bits of other foreign matter causing damage to goods.

Chalk whiting only should be used for dusting stocks. Gilders grade is the lowest grade permissible for compounding rubber footwear upper stocks and therefore is suitable for dusting soft rubber stocks of every quality. Chalk whiting is absorbed readily and harmlessly into any soft rubber stock and can be readily and completely wiped from its surface with a rag wet with naphtha or thin cement.

Soapstone for rubber workers' use is an impure form of talc. It is off-color white and chiefly useful for dusting raw stock for molding or open steam curing. Arranged in shallow pans or trays, it serves as "curing beds" for certain rubber products. The goods are packed and covered with soapstone to equalize the heat on the top layer of goods. The contents of the curing tray is shielded from direct contact with the steam by loosely fitted sheet metal covers. The latter serve also to exclude entrance of water to the pan, which would interfere with curing the goods evenly.

It may be remarked that fine pumice was at one time used as a bedding for curing water bottles, syringe bags, etc., when such goods were vulcanized by hot air in box heaters. Pumice was preferred to soapstone in this method because the pumice washes off the goods easier and cleaner than soapstone, leaving the articles of good color. This method is no longer practiced, but the reason for its preference is worth noting.

Clay is used for stock dusting but is not desirable for essentially the same reason that soapstone is not. It is too difficult to remove from the rubber and liable to introduce grit.

Slate flour is liable to contain gritty particles making it unsuitable for dusting quality stocks. Its similarity to clay makes it difficult to remove it completely from raw rubber surfaces.

Wheat flour may be applied as a dusting coat at the calender on the skim coating applied to the back of flat-knit wool-fleece lining for boot and shoe work, also for dusting both sides of sheet rubber to be rolled and cut into ribbon form as seam stripping on belting, and similarly for dusting tubed cord used in the joint of belting cover, and for other work where adhesion is to be prevented temporarily without subsequently interfering with permanent adhesion of the parts on vulcanization.

The grade of flour used for rubber dusting is the "Red Dog," "Daisy," and "Low Grade" brands. Such flour is unfit for baking purposes. It is high in protein and has considerable fat content; therefore is an excellent feed for animals and most of it is used for that purpose. Its chemical composition is approximately as follows:

	Per Cent
Moisture	11.5
Protein	16.4
Ash	2.6
Fat	4.0
Fiber	2.5
Carbohydrates	63.0
	100.00

Kerosene

Kerosene is a petroleum product refined primarily for use in lamps, stoves, and heaters. The refiner makes no effort to modify its characteristics when used for other purposes. A typical specification for kerosene is that given is U. S. Bureau of Mines Technical Paper 323-B, which is as follows:

Color	Water white
Viscosity, Saybolt	16 min.
Flash, Tag. closed cup	115° F. min.
Sulphur	0.125% max.
Flock	None
Distillation	625° F. max. end point
Cloud at 5° F.	None
Burning time	16 hours

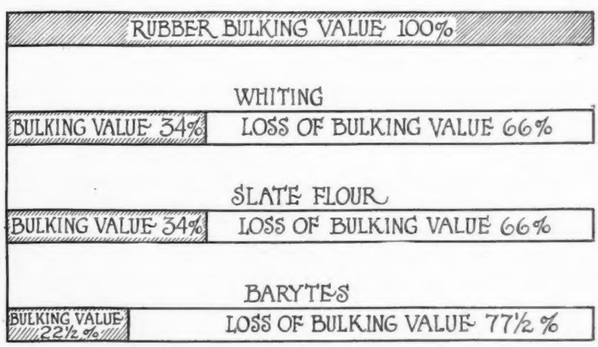
Kerosene is freely used in processing uncured hard rubber. All sheets and slabs of calendered stock are handled upon perfectly smooth zinc or aluminum covered tables wet with kerosene to prevent adhesion of the rubber. Hard rubber sheets are water cured between sheets of planished tin; combs and other articles are similarly cured encased in tin. In such cases the rubber and metal surfaces are wet with kerosene to prevent the liability of trapping air between rubber and metal and to permit ready separation of the metal from the rubber after curing.

Chemicals for Sponging

The tendency of rubber to "blow" or become porous during vulcanization is a common cause of damaged goods. The obvious remedy is to prepare the stock so that it will be free from moisture or volatile solvents at the time of vulcanization. Molded articles should be cured under heavy pressure followed in some instances by cooling in the press to a temperature below that at which volatile matters present can exert pressure. Low temperature cures are advantageous because less time need be allowed for cooling when necessary.

When sponging the interior of an article is desired, materials suitable for producing that effect, and no other, must be incorporated in the mixing. These materials may be either freely volatile or readily react at curing temperatures to liberate a copious volume of harmless gas thoroughly distributed through the mass. The internal pressure thus generated will cause uniform sponging.

Ammonium carbonate, a chemical combination of ammonia and carbonic acid, was long the usual agent for sponging rubber. This material, when exposed to the air, loses strength rapidly by the escape of its ammonia. The material comes sealed in air-tight containers and should be kept in a cool place. The powder form is preferable to the lump because less is lost by handling. It is added to the rubber mixing in liberal proportion, 10 to 12 per cent on the gum



Relative Bulking Values, Rubber = 100 Per Cent

in the batch at the end of the mixing period. The ammoniated stock must be promptly processed and cured to conserve its sponging quality. The loss, in handling dry ammonium carbonate is great. The consequent uncertainty of its available sponging effect in a given rubber mixing has caused it to be superseded generally by substitute methods and materials.

A convenient form in which to use ammonium carbonate

is prepared by grinding together 75 per cent of ammonium carbonate with 25 per cent of spindle oil. This mixture mills into a rubber mixing smoothly and aids the dispersion of all the ingredients present. The oil prevents the ready volatilization of the ammonia. The prepared rubber batch thus retains its ability to sponge, and the scrap does not require additions of ammonium carbonate as when dry ammonium carbonate is milled into rubber. Three and one-half per cent of this mixture on the rubber content of the batch produces liberal sponging. This composition is known as Riso compound.

Common Ingredients for Economy, Processing, and Constructive Effects

For Economy and Cheapness	*Chemicals for Sponging*
Barytes, Blanc fixe	Ammonium Carbonate
Whiting	Riso Compound
Slate Flour	Sodium Bicarbonate
	Stearic Acid
Processing Helps	Oleic Acid
Whiting	
Soapstone	*Inflation Materials*
Clay	Aqua Ammonia
Slate Flour	Water
Wheat Flour	Wet Clay Mixture
Kerosene	Air

Sponging by means of ammonium carbonate is also superseded in current practice by the use of sodium bicarbonate and a fatty acid, either stearic or oleic acid, the red oil of commerce. The reaction under the influence of the curing temperature liberates carbonic acid gas producing the desired sponging effect. The likelihood that the soap resulting from the reaction of these ingredients may impair the aging properties of the sponged rubber is apparently not appreciable in practice. The method is extensively used and the sponges age well. The proportions required are 4 to 5 per cent of sodium bicarbonate and 8 per cent of stearic or oleic acid on the rubber content of the mixing.

Sodium bicarbonate, ordinary baking soda, is the acid carbonate of soda. It is inexpensive, harmless, and keeps indefinitely with no special care other than to keep it dry.

Stearic acid is a wax-like solid. It occurs combined with glycerine in animal fat. It is commonly derived from beef fat by saponification or distillation. The process breaks up the fat chemically, liberating both stearic and oleic acids. Following this, the material is pressed to remove the liquid oleic acid (red oil) without the aid of heat. The pressed stock remaining is next hot pressed, once, twice, or three times, to remove more of the low melting point material, leaving behind the purified stearic acid, which is molded into cakes or ground. Its gravity is 0.847, melting point 126° F. The single pressed grade is that commonly used in rubber work.

Oleic acid, or red oil, is a product of the breaking up of fat and is obtained in the process indicated above. It is liquid at ordinary temperatures and solidifies at 39.2° F. Its gravity is 0.89.

Inflating Materials

All molded hollow rubber articles such as balls, dolls, toys, etc., are inflated to size and contour by internal pressure generated within the article by the action of materials enclosed in the air-filled object by the maker. The means generally used are ammonia water, water, or a watery paste of china clay. The inflation in any event is practically by steam generated by the heat from the mold during curing. The walls of all inflated rubber articles require to be thoroughly impervious to retain the inflation pressure. On curing, they must be held in the molds until sufficiently cooled to withstand any residual pressure without distortion. Similarly sponge rubber requires cooling before release from the mold.

Subsequent to vulcanization hollow balls are inflated to some definite pressure with air injected through the wall by a hypodermic needle inserted through a bit of raw pure gum serving as a seal to retain the air pressure.

Acknowledgment

For data used in this article the author acknowledges indebtedness as follows: barytes, C. P. De Lore Co.; whiting, The Taintor Co. and R. T. Vanderbilt Co.; wheat flour, The Pillsbury Flour Mills Co.; kerosene, The Standard Oil Co. of N. Y.; sponging chemicals, The Rubber Service Laboratories Co.

EBONITE DUST MOLDING[1]

PROBABLY more ebonite dust is used for direct molding into small articles of hard rubber than is used as a rubber compounding ingredient. The advantages of ebonite dust molding over raw ebonite dough composition molding are numerous and important both as to cost and technical quality.

Success with this process requires the use of ebonite dust standardized as to quality and fineness with the view of giving the best possible results.

In outline the process consists in forming the required article direct from ebonite dust with no add-mixture of any kind.

Plunger-type molds of special steel are used and may be plated for better finish of the cavity. As in other molding processes, the finish on the article depends entirely upon the mold surfaces. The molds themselves must be suitably designed for the particular article, and certain fundamental principles are to be observed as the design differs in some respects from those used in forming bakelite and other synthetic resins.

The ebonite powder is molded under heat and pressure; the temperature employed is somewhat higher than is usual when dealing with ebonite in the ordinary form. The resulting article can be molded to size within extremely close limits as the shrinkage of the stock is very much less than is the case with ordinary ebonite molding. The curing or molding time varies from 3 to 5 minutes for small and average sized articles.

Briefly stated the process possesses these advantages: (1) preliminary mixing and calendering operations are not required; (2) the material cost is slightly less for equivalent qualities; (3) the molding time is 5 minutes for the finished object as compared with 20 to 30 minutes for the setting cure of ebonite articles made by the dough method; (4) no final cure of 4 to 5 hours is required to finish the vulcanization as in the case of semi-cured dough moldings; (5) there is no distortion or discoloration of the goods before or after aging, hence, no reject factor; (6) dust molded articles have a bright mold-finish and do not require machining or polishing. The last two items alone represent a very considerable economy in manufacturing.

Summarizing the dust-molding method of hard rubber goods manufacture, such goods can be produced almost as rapidly and cheaply as those made of any other molding powder with the additional advantage of better electrical and mechanical properties.

[1] Data from James Ferguson & Sons, Ltd., London, S. W. 19, England.

The Recovery *of* Volatile Solvents

In the Rubber Industry

THE importance of solvent recovery has been obvious for several years to many industries employing volatile solvents in manufacturing.

This problem is specially important in the rubber industry because of the large amount and cost of the different solvents utilized: benzene, solvent-naphtha, toluene, etc. Accumulation of these vapors in the workroom atmosphere constitutes a danger to the worker's health and a fire and explosion risk at the same time. If these vapors are allowed to escape without condensing them, a waste results that, considering competition, means heavy losses.

That is why numerous methods for recovering the evaporated solvents in rubber working have been tried.

The main processes for solvent recovery are: 1. condensation; 2. absorption by liquid absorbents (coal tar oil or tetralene); 3. absorption by solid absorbents.

The first two methods are not considered since they are used less and less because of their inefficiency or the difficulty they bring to manufacturing processes.

Long ago the attention of scientists was drawn to the property that charcoal possesses, more or less markedly, to absorb and hold in its structure vapors of volatile liquids and the possibility of liberating them by subsequent heating. It was also discovered that the absorptive property could be considerably strengthened by suitable physical or chemical treatment, which constitutes activation, properly speaking.

The idea of practically utilizing this property is also old, but we owe to the Great War the industrialization of activated charcoals, for these solved the problem of protection against obnoxious gases.

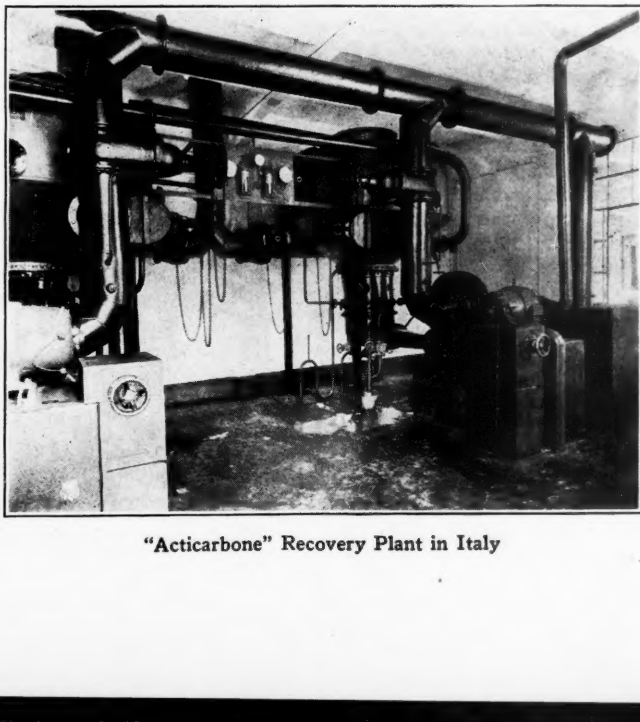
In the rubber industry the recovery process is as follows: The benzene or solvent-naphtha vapors diluted with the air are gathered at the spreading machines by suitable hoods and piping, which need not be explained in detail. These systems are generally simple and do not hamper at all the work or supervision of rubber spreading.

The covers used for this purpose can be utilized on any form of spreading machines. The vapors as collected are aspirated into an absorbing apparatus and pass through a layer of granulated activated charcoal. By this operation the air is totally free from its solvent-naphtha vapor, which remains entirely in the charcoal pores. To recover the solvent-naphtha, one need only subject the charcoal to steam, which removes the solvent-naphtha. The two condensed products (water and solvent-naphtha) separate by their difference in specific weight, and the charcoal, suitably cooled, is made fit again to absorb more solvent. If necessary, two absorbers work alternately, one for absorption of solvent-naphtha vapors while the other is on distillation and regeneration.

Solvent recovery by using the patented "Acticarbone" process embodies important improvements on the operating system described above. The use of superheated steam, which was critical and sometimes dangerous, has been discontinued. It has been succeeded by new principles regulating the heat exchanges inside the absorber. The perfected apparatus salvages about 95 per cent solvent by use of ordinary, not superheated, steam.

Advantages of the "Acticarbone" process are:

1. It makes possible treating air having a very low solvent content (1 per 1,000 in volume). The primary advantage of recovery by activated charcoals—especially "Acticarbone"—is in their remarkable absorptive properties. The absorption capacity of activated charcoals is in fact very high even with the leanest solvent contents. Solvent-naphtha recovered by means of "Acticarbone" processes is particularly pure and capable of being readily reused. It contains neither entrained carbon nor water and is identical with that originally used.
2. It reduces fire and explosion danger and insurance.
3. Very small loss of activated charcoal, in some cases less than 2 pounds per ton of solvent-naphtha recovered, occurs.
4. It quickly pays off installation cost because of high efficiency and the low steam and electricity consumption.



"Acticarbone" Recovery Plant in Italy

Those details show the advantages of utilizing activated charcoals in the rubber industry, and the savings should help manufacturers realize that studying the application of such processes in their own factories will prove profitable.

Numerous rubber manufacturers in Europe have recently adopted the "Acticarbone" process with great success.

Rubber Cements and Adhesives

S. D. Sutton, F. C. S., A. I. R. T., (Tech.)

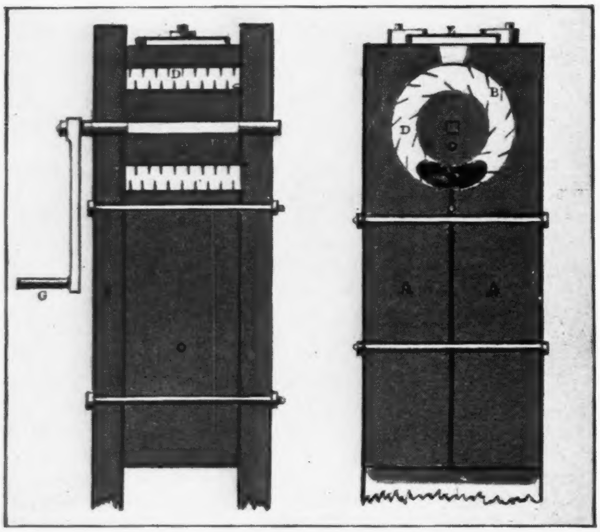


Fig. 1—Diagram of T. Hancock's Original Masticator
Reproduced by permission of James Lyne Hancock & Co., Ltd., London

AA, *two pieces of wood bolted together;* **B**, *a hollow cylinder cut out of* **AA**, *and studded with teeth;* **C**, *a cylinder of wood studded with teeth, and having a spindle passed through it;* **D**, *space between the two cylinders* **B** *and* **C**; **E**, *an opening with a cover;* **FF**, *two pieces of wood bolted on both sides of* **AA**, *and enclosing the space* **D**, *and cylinder* **C**; **G**, *a winch. The darkened spot in space* **D** *represents the charge of rubber.*

THE past ten years have seen many changes in the technology of rubber in all its applications, and although more gradual, perhaps, than in some of the more important branches, the rubber cement and adhesive industry has evolved from the old term "rubber solution" to a highly specialized art. Para rubber cut with naphtha served until a few years ago for all purposes where rubber goods had to be joined, and the solution was prepared in some odd corner of the factory as a side-line. Nowadays, the manufacture of rubber cements and adhesives is carried on in special departments, or, as is largely done in Great Britain, by firms who study the requirements of the numerous industries in which these cements are used, and concentrate solely on their production.

The discovery of the mastication of rubber by Hancock in 1823 enabled the first concentrated solution to be made and formed the real basis of rubber cement manufacture. The original Hancock masticator is illustrated in Figure 1.

Wild rubbers only were available at this time and Para rubber became the chief ingredient for rubber solutions. The introduction of plantation rubbers failed to displace Para rubbers for many years, and even at the present day there is a large demand for Para solution although just as effective results are to be obtained by using plantation rubbers that are prepared under proper conditions. Modern adhesives and cements incorporate mostly crepe or smoked sheet, and by suitable compounding these cements are capable of joining materials considered to be impossible a few years ago.

The choice of a suitable solvent is extremely important, for even if the rubber is prepared correctly, altogether different results are obtained by the use of various solvents. Gasoline is mainly used in the United States while coal tar naphtha still holds premier place in Great Britain among the solvents, the latter being used extensively in the proofing and garment industries. This solvent, although by no means the most efficient, is one of the least toxic of rubber solvents known to the trade and is obtainable at a fairly low cost.

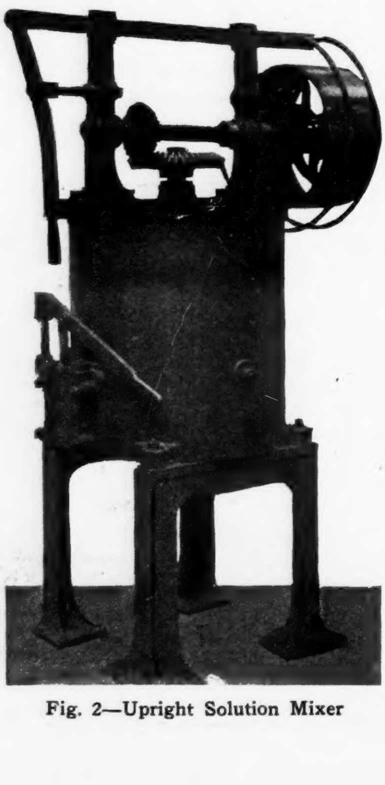


Fig. 2—Upright Solution Mixer

The recent improvements in the production of various grades of gasoline have led to their adoption for solvent purposes. Providing that the free paraffin oil content is carefully controlled, these "white spirit" solvents are quite suitable for rubber and are much cheaper than naphtha. The presence of paraffin oil retards evaporation and is to be avoided, as even the smallest quantity prevents the rubber solution from drying within a reasonable period.

Benzene is an excellent solvent and is specially suitable for rubber cements where quick drying is es-

sential. Various grades of benzene are obtainable, the 90 per cent and pure qualities having the most commercial use, but unfortunately the purer the benzene the more toxic it becomes, and this has considerable disadvantages, especially where fume regulations are in force.

The factory regulations in certain industries prohibit the use of inflammable solvents, and at one time the use of rubber solution presented many difficulties, but the discovery of carbon tetrachloride as a rubber solvent with its non-flam qualities has helped to solve this problem. Later trichlorethylene was introduced as a non-flam solvent, and as it is cheaper and slightly lighter in gravity than carbon tetrachloride, soon found favor. As the non-flam solvents mentioned have poisonous fumes, which are heavier than air, proper ventilation is essential when large quantities are handled. Sunlight, air, and moisture decompose these solvents if they are exposed for prolonged periods, giving rise to free hydrochloric acid.

Non-flam solvents are more expensive than the in-flam type; therefore some manufacturers use mixtures of the two kinds in such proportions as to retain the non-flam qualities. For example, 25 per cent by volume of naphtha can be added to carbon tetrachloride, the mixture being non-inflammable and will in fact extinguish a lighted match.

For many years rubber solutions were made in the upright solution pug as shown in Figure 2. This type of mixer is still in use in many factories, but is more extensively applied to the manufacture of heavy doughs for spreading purposes.

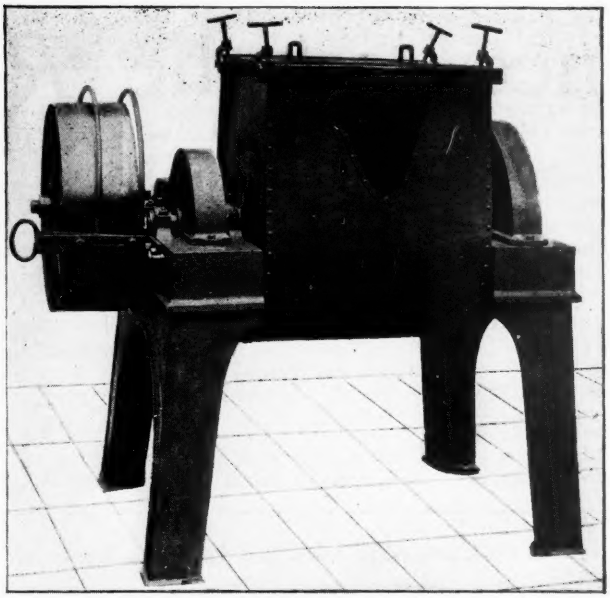


Fig. 3—Rapid Mixing Solution Mill

The solution mill shown in Figure 3 is of the latest type for rapid solution mixing. The mechanical action comprises two curved arms, which move in opposite directions, continually turning over the contents of the mill and dispersing any lumps that have formed.

These mills are capable of completing a charge every eight hours and effect a great saving of time over the older types, especially where thin solutions are required. To increase further the output, the rubber can be cut into small pieces and soaked for a few hours in a vessel with a little solvent, when the rubber swells and rapidly "goes down" when in the mill.

The degree of mastication plays an important part in the preparation of all rubber cements and more particularly affects the modern types which incorporate organic accelators. With Para rubber and other wild rubbers prepared under similar conditions, washing and drying is an essential preliminary to mastication, the extent of the latter operation determining the viscosity of the solution and, if unvulcanized, the strength of the rubber film deposited upon evaporation.

The choice of plantation rubber lies chiefly between smoked sheet and pale crepe, and providing the usual control tests are carried out, smoked sheet gives fairly uniform results. Pale crepe, however, is affected by the methods used for manufacture on the estate, it being generally found that Ceylon blanket crepe gives the best all-round results for solution making. Stronger cements can be made with blanket than with thin crepe, particularly pure unvulcanized cements. Methods to overcome variability in the raw rubber will be given in a later article.

TABLE I

Suitable Solvents for Rubber Cement Manufacture

Benzene Pure.	Excellent solvent. Rapid drying. Suitable for high grade tire repair and shoe cements.
Benzene 90°.	Extensively used for quick-drying cements. Contains roughly 10 per cent impurities, mostly toluene.
Benzene 50°.	Good solvent used for cheaper grades of shoe cements. Contains about 50 per cent toluene xylene carbon disulphide and other impurities.
Carbon Disulphide.	Good solvent used mainly for cements containing gutta percha and balata. Very poisonous.
Coal Tar Naphtha.	Extensively used for garment and shoe cements. Does not dry so rapidly as benzene.
Shale Naphtha.	Little used at the present time. It is more expensive than coal tar naphtha and not quite so good a solvent. Can be used as a substitute should supplies of coal tar naphtha fail.
Petroleum Spirits (Gasoline).	There are many grades on the market under various names. Largely used for cheap solutions of all descriptions. They are mostly slow drying and require careful con.rol to insure uniformity.
Carbon Tetrachloride.	Non-flam solvent. Used for non-flam cements of all kinds.
Trichlorethylene (Westrasol).	Largely used in preference to carbon tetrachloride, mainly for cheapness.

Finance and the Rubber Industry

Tire Costs Are Low Due to Minimum Cost of Rubber and Cotton—Tire Stocks Are the Largest on Record—Cost of Distribution of Tires Is Not Lowering—Mail-Order Distribution of Tires a Menace

A. T. HOPKINS

AS A general rule, earnings of an industry rise and fall with the volume. The rubber industry has been a notable exception. The raw material situation has subjected the industry to hazards from time to time so great that capacity operations and a steadily improving operating efficiency could merely reduce their severity.

From the standpoint of materials, tire costs depend in the main upon the prices at which rubber and cotton are obtainable. In the past, excessive losses have been traceable to price collapse in one or the other of these two principal commodities — crude rubber or cotton fabric. But these have never occurred except from levels much higher than those now prevailing.

The innumerable losses of 1920 and 1921 resulted from an excessive inventory, which hit the larger tire companies more severely than the smaller companies, and from a price decline in cotton fabric from around $2.50 per pound to $0.70 or thereabouts. Five years later, the crude market soared when restriction of exports created an actual shortage, only to experience a shrinkage to one-third their previous levels within the following ten months. As recently as last year, purchases of crude rubber made during January and February might have been duplicated in June at one half the cost.

Although the last decade has been a period of erratic prices for these essential commodities, compelling acceptance of heavy write-offs at recurring intervals, the industry today is situated in a unique position in respect to its raw material. Never before in the history of the industry have combined raw material costs been so low. Certainly the raw material hazard is now at a minimum.

It is interesting at this

Table 1. Comparing Sales and Profits of Nine Tire Manufacturers, 1923-1928

	1923		1924	
	Sales	Profits	Sales	Profits
Firestone	$77,583,150	$6,104,592	$85,610,004	$8,116,689
Fisk	44,862,743	2,583,613	52,946,531	3,136,664
General	9,000,000	1,200,000	13,152,500	1,500,000
Goodrich	107,092,730	3,025,383	109,817,685	8,822,504
Goodyear	106,026,109	6,507,245	115,323,174	12,161,540
Lee	9,390,397	*71,813	12,586,370	*234,472
Mohawk	....	....	3,413,731	343,656
Seiberling	....	....	7,353,137	1,013,022
United States	186,261.381	7,392,656	172,214,353	9,068,035

	1925		1926	
	Sales	Profits	Sales	Profits
Firestone	$125,597,998	$12,800,412	$144,397,000	$7,622,339
Fisk	74,900,373	7,608,905	68,051,739	6,000,000
General	18,700,000	1,843,299	20,100,000	709,831
Goodrich	136,239,526	16,700,000	148,391,478	5,065,110
Goodyear	205,999,829	26,284,672	231,161,356	8,799,138
Lee	12,743,585	300,209	12,213,076	....
Mohawk	5,182,788	580,649	6,500,000	*223,000
Seiberling	10,569,522	1,244,967	14,920,294	359,117
United States	206,473,737	17,309,870	215,528,309	8,535,380

	1927		1928	
	Sales	Profits	Sales	Profits
Firestone	$127,696,759	$13,780,966	$125,664,666	$7,072,014
Fisk	‡72,404,002	‡2,620,721	60,933,841	*8,791,251
General	23,692,500	2,524,325	26,154,000	2,002,000
Goodrich	151,685,690	11,780,306	148,250,000	3,500,000
Goodyear	222,178,540	13,135,666	250,769,209	13,327,843
Lee	....	....	....	....
Mohawk	5,702,372	631,171	6,590,646	766,040
Seiberling	§12,367,114	1,356,707	16,329,111	876,716
United States	193,442,945	10,232,052	193,480,121	*10,781,255

* Denotes loss. ‡ Fourteen months. § Ten months.

Table 2. Financial Situation of Nine Tire Manufacturers, 1928

As of Dec. 31, '28	Goodyear	United States	Goodrich	Firestone (Oct. 31, '28)	Fisk	General (Nov. 30, '28)	Seiberling (Oct. 31, '28)	Lee (Oct. 31, '28)	Mohawk
Annual sales for 1928	$250,769,208	$193,480,121	$148,805,178	$125,664,666	$60,933,841	$26,154,000	$16,329,111	$11,032,914	$6,590,646
Market valuation of common	152,400,000	68,500,000	69,616,000	89,000,000	12,700,000	20,668,000	7,360,000	3,750,000	4,450,000
Par value prior obligations	165,427,235	167,584,500	56,923,582	46,983,400	38,225,100	3,360,100	1,757,500	0	2,789,280
Total market valuation	$317,827,235	$236,084,500	$126,539,582	$135,983,400	$50,925,100	$24,028,100	$9,117,500	$3,750,000	$7,239,280
Per cent represented by common	48%	29%	55%	65%	25%	86%	80%	100%	62%
Earned per share present common									
Year 1927	$5.35	nil	$9.75	$32.87	$0.67	$21.00	*$3.84	*$2.61	$4.31
Year 1928	5.50	nil	1.17	14.83	nil	19.20	1.15	0.55	4.69
First half 1929	7.02	nil	4.11	‡	nil	‡	‡	0.76	1.82
Yield from present regular dividend	4.6%	....	5.5%	3.3%	....	1.6%	3.3%	....	11.7%
Current assets	$118,532,589	$148,158,379	$69,606,599	$52,874,235	$29,117,985	$10,207,232	$4,808,776	$6,221,110	$2,363,878
Current liabilities	14,969,977	43,160,786	16,251,669	6,378,748	6,953,784	1,102,680	1,234,383	2,294,736	411,721
Working capital	103,562,612	104,997,593	53,354,930	46,495,487	22,164,201	9,104,552	3,574,393	3,926,374	1,952,157
Inventories	68,736,251	66,548,618	36,667,968	24,759,510	17,420,010	4,050,355	2,119,435	2,983,055	824,767
Inventory turnover (sales divided by inventories)	3.6	2.9	4.0	5.1	3.5	6.4	7.7	3.7	8.0
Net tangible assets per com. share (adjusted to present capital)	$36	$37	$54	$151	$10	$96	$22	$27	$6

* Ten months. ‡ Not available.

particular point to glance at the two tables we show.

Table 1 compares the sales and profits of the leading tire manufacturers during the last six years. Table 2 analyzes the financial situation of the same companies during the year 1928, this being the year of the rubber market collapse. It is no wonder that bankers look askance at most tire companies.

We now come to the most difficult part of our paper. What of the future? We have shown that the situation from the point of view of raw material prices is unusually favorable. The market can hardly go lower. But what of stocks of tires which are the largest on record? This would seem to call for a slowing down of operations unless large inventories are to be carried over into the new year.

While raw material costs were fluctuating widely, smaller units held a distinct advantage over the larger ones. Small companies, able to satisfy their raw material requirements with negligible forward purchases, were able to meet changing conditions. The advantage in this respect frequently more than offset productive cost differentials. The relatively stable prices obtaining during the past fourteen months have, we believe, transferred the advantage to the larger companies. Greater output is conducive to lower manufacturing costs, and large sales volume makes possible economies in distribution. A continuance of the conditions existing over the past year will tend to further entrench the position of the larger units.

But—will these conditions continue? What about sales conditions? This is the main problem today in almost every industry, but especially serious is it in the tire business. The mail-order house and chain store is in the game and the war is on. We say "war" advisedly when certain service stations refuse to service a mail-order tire. The mail-order houses apparently can market a tire cheaper than anyone else, and the factories supplying such tires are apparently doing so at a profit.

It would seem to be in order for the tire companies to put their best thought on the problem of merchandising. Perhaps the example of McKesson Robbins in another field may offer some fruitful suggestions.

Coloring Toy Balloons

Striking and Attractive Results Obtained by This Process

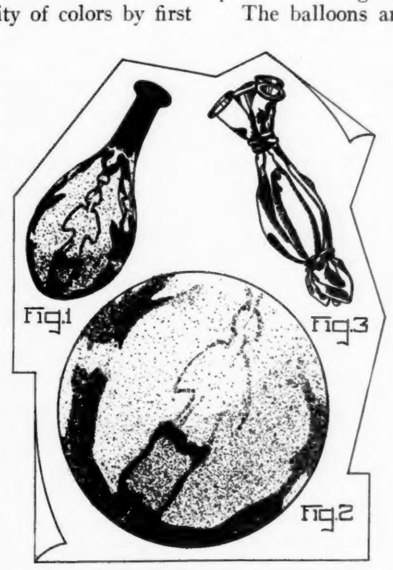
TOY balloons ornamented by uniquely variegated surface coloring are more attractive and salable than plain-colored and pictured balloons because the color variegations are fantastic and not alike on any two balloons. The group illustrations indicate the method used in producing this variegated coloring.

Figure 1 illustrates a toy balloon after it has been colored by the process involving a new invention.[1] Figure 2 indicates the coloring produced when the balloon, illustrated in Figure 1, is distended. Figure 3 illustrates a bundle of one or more balloons preparatory to their introduction into the balloon-coloring material.

In carrying out this process, the balloons are colored over irregular areas and with variable intensity of colors by first bundling from one to six balloons together, without care as to their relative location, wrinkling, or folding of parts. They are then dipped into coloring materials contained in warm water at a temperature from 125 to 180° F. and are allowed to stand from one to five minutes in the color. The small bundles of balloons are then washed and rinsed in water, at a moderate temperature, the bundles being stirred to remove the surplus coloring material that does not adhere to or penetrate the surface of the rubber. The bundles are next separated and the balloons permitted to dry ready for shipment.

Inasmuch as separate balloons cannot be made so that the parts of the balloons bundled will be located in exactly the same relation to each other, the process cannot possibly produce any two balloons exactly alike in coloring.

[1] U. S. Patent No. 1,720,594, July 9, 1929.



A New Coloring Process

If it is desired to color balloons in several colors and their tints, the bundled balloons are dipped into the different colors successively being thoroughly washed and rinsed between the separate dips.

This process may be repeated as many times as desired to produce various intensities of the colors and the varieties and combinations that arise from mixing colors, such as greens produced by yellows and blues and purples produced by reds and blues. Also, an exceedingly attractive effect is produced by rebundling the balloons in bundles of 1 to 6 after they have been colored by one color and then insert them in a second color which will produce other variform patterns having variegated color and shades.

The balloons are formed to have a basic color contained in the composition of the balloon itself which is, preferably, contrasting to the colors that are added, in the manner described. The greater the contrasting character of the rubber the more effective will be the colors added on the surface.

Thus, as shown in Figure 1, the directly exposed portions of the balloon are colored to the maximum intensity, depending on how long the balloon remains within the coloring material. The shaded portions are produced by the various degrees of penetration of the coloring material within the folds and wrinkles caused by irregular bundling.

When the balloons are distended as shown in Figure 2, the colorings become lighter, but the strikingly characteristic and attractive appearance is retained. The parts become enlarged and distorted, a feature which serves to aid the salability of the article.

Making Tire-Type Changes[1]

Care to Be Taken When Substituting Motorcoach Balloon and Motor-Truck Pneumatic Tires

Tire size, in.	6	7	8	9	10
Rim size, in.	6	7	8	9	10
Load for 20-in. diameter wheel, lb.	2,200	2,800	3,600	4,500	5,500
Load for 24-in. diameter wheel, lb.	2,500	3,200	4,000	5,000	6,000
Air pressure, lb. per sq. in.	90	100	110	120	130

THE rule is generally accepted that the best service is obtained from high-pressure pneumatic motor-truck tires when the load is such that the deflection of the tire does not exceed 14 per cent of the cross-section. With motorcoach balloon-tires, a maximum deflection of 18 per cent is the limit; high-pressure and balloon passenger-car tires may deflect 15 and 21 per cent, respectively. Thus the maximum recommended load-carrying capacity of a tire is the product of the air pressure and the area of contact of the tire with the road. The area of road contact is mainly determined by the diameter and cross-section of the tire and the tread contour. Hence, if it were desired to substitute a tire designed for high air-pressure by a low-pressure tire, it would be necessary to increase the area of contact of the tread with the road, and this might necessitate an increase in tire section. That is exactly what happened when the balloon tire was designed to replace the high-pressure tire.

High-pressure pneumatic tires for motor-trucks are designed for 20- and 24-in. wheels. The recommended load and inflation pressure for these tires are listed in the accompanying tabular statement.

Balloon tires for motorcoach and motor-truck service are made in 20- and 22-in. diameter and call for inflation pressure of 50 to 75 lb. per sq. in. The motorcoach balloon tire has established itself in the transportation industry, and the fact has been proved that increased riding comfort can be obtained without sacrificing tire performance. The motor-truck balloon tire is less widely used, and the choice of this type of equipment is largely a matter of the requirements for specific types of service.

Operators of motorcoaches equipped with motorcoach balloon tires on the Pacific Coast have found that this type of tire equipment reduces maintenance, causes fewer road delays, and gives increased satisfaction to the passengers. For a time some opposition existed to motorcoach balloon tires for stage equipment, as some operators feared that the occurrence of a flat tire at high speed might constitute a hazard; but the fact has been proved repeatedly that no greater hazard results from flat tires with motorcoach balloon tires than with high-pressure tires.

The substitution of motorcoach balloon tires for high-pressure pneumatic tires does not require a wheel change if the wheel diameter is 20 in., but a wheel change is necessary if the rim diameter is 24 in.

Use of the larger tire requires slightly greater body and fender clearance. It is also necessary to make certain that steering-rod arms, brakes, toggles, etc., have sufficient clearance. If dual-tire equipment is used, it is also necessary to consider the clearance between the two tires, as the larger tires require more clearance here than do the smaller high-pressure tires. Clearance between the tires is the distance between the center of the treads of the outside and the inside tires.

Conditions Affecting Dual-Tire Usage

The mating of dual tires involves such variables as tire wear, pressure build-up, and road crown. The first can be controlled to a certain extent by following the practice of mating tires that show the same amount of wear. New tires should be mated, and worn tires should be mated according to the amount of wear; but new tires and worn tires should not be mated, because the over-all diameter of a new tire may in some cases be less than that of a tire which has been in service. Fatigue of the fabric with service results in an increase in cross-section and over-all diameter of the tire; but counteracting this increase is the decrease resulting from tread wear. These differences probably are less in high-pressure pneumatic tires than in motorcoach balloon tires.

Under operating conditions the inside dual tire usually carries more load than the outside tire. As a rule the inflation pressure is increased to increase the carrying capacity; but, in this case, increasing the pressure of the inside tire would raise the outside tire and throw more load on the inside tire. Lowering the pressure on the inside tire is undesirable; therefore the only alternative is to increase the pressure on the outside tire. However, in service, the pressure in the inside tire increases to a greater extent than that in the outside tire. This throws the inflation adjustment out of balance and it is impossible to determine what excess pressure should be carried in the outside tire. As yet no generally accepted simple and reliable device is available for equalizing the pressure between outside and inside dual pneumatic tires.

Changing from Solid to Pneumatic Tires

Increasing legislation against solid-tire equipment makes a change-over to pneumatic-tire equipment desirable in some types of service. Many operators are finding that pneumatic-tire equipment reduces their operating costs as a result of increased speed and lower maintenance costs. The substitution of pneumatic for solid tires is easier in the West than in the East, because the axle equipment is better standardized and wheels are more readily available.

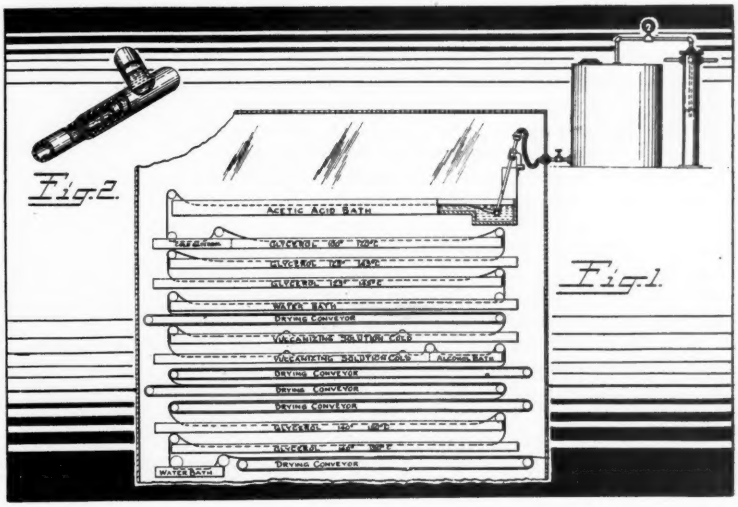
Proper tire clearance is just as important as for changes from high-pressure to balloon-tire equipment. The use of 24-in. tires is advisable wherever possible, as this will often avoid trouble that might arise from insufficient brake-drum clearance. The minimum clearance of the tire with the nearest point of interference should be 1 in. The tires should not extend beyond the fenders nor rub against them when the springs are fully deflected. Special attention should be given to the amount of offset necessary for the felloe to provide proper body and brake-drum clearance.

[1] Courtesy of *S. A. E. Bulletin*. Paper presented before Northwest Section, A. S. T. M., at Portland, Ore.

Uses of Rubber Latex

A Survey of U. S. Patents Relating to the Direct Applications of Rubber Latex in the Industries

JOSEPH ROSSMAN



United States Patent No. 1,570,895

DURING the last few years a large number of patents have been granted for the direct uses of rubber latex in many diverse fields. The unique properties of latex have rendered it useful in hundreds of different ways. It can be used as a waterproofing agent, adhesive, preservative, and as an important ingredient in innumerable plastic compositions.

Although latex has begun to be used only recently in industry, it has been known and used a long time ago. Latex was used by the Amazons in ancient times for waterproofing their fabrics and boats and for making many articles. In 1759 a suit of waterproof clothes was sent from Para to the King of Portugal. The first patent for the use of latex was granted in 1791 to Peel in England for waterproofing cotton and paper.

In 1824 Thomas Hancock obtained British Patent No. 1,824 for making artificial leather from latex. He spread out layers of fibers and saturated them with latex in a trough. The sheets were then dried and pressed. His observations on the properties of latex written over a hundred years ago are very interesting.

"The juice or liquid," he states, "I have made use of was obtained from South America, and from my own experience I find that the said juice or liquid when exposed to the open air, in the sun, or in a warm room, becomes inspissated or dried, and then forms a substance exactly resembling, and which I believe to be identically of the same nature and to possess the same properties with the substance well known by the names of caoutchouc or indian-rubber, or elastic gum, and it is employed abroad for that purpose. Its color and consistence very much resemble cream. In manufacturing any article where the color is not an object I employ this liquid in its natural state, without any previous preparation, excepting that of freeing it from ligneous or other substances by straining it through a sieve or cloth."

Hancock obtained several more patents for the uses of latex but gave up its use for industrial purposes for several reasons. He had difficulty in obtaining the natural latex because it coagulated during transit. Later on although the preservative properties of ammonia were discovered, Hancock thought that the large water content of latex made it too expensive on account of the cost of vessels and freight.

The greater portion of rubber used at the present time is obtained from the latex of the *Hevea brasiliensis*, this being the tree from which most of the rubber gathered on the Amazon and its tributaries is obtained, and is also the tree which is most exclusively cultivated in Ceylon, Federated Malay States, Straits Settlements, Sumatra, and other parts of the East. Until recently all the rubber from this latex was coagulated. In Brazil the method consists of collecting the latex from the trees and immediately proceeding with the coagulation, which is effected by dipping a paddle in the latex and then holding the paddle with the layer of adhering latex over the smoke of a fire made of urucuri nuts, which give off fumes having astringent properties thereby coagulating the latex. The paddle is repeatedly and alternately dipped and held over the fire so that a mass of coagulated rubber is built up on it in layer formation.

On the plantations in the East the process of coagulation consists of collecting the latex and immediately adding acetic acid or some similar chemical to the latex and stirring it until a coagulum is formed, which consists of a spongy mass separated out of the latex and having generally the characteristics of curds separated from milk. Another process is to permit the latex to stand in a warm atmosphere, which brings about what is called natural coagulation. After the coagulum is formed, whether by the first or second process, it is taken out of the residual fluid and passed through rolls to squeeze out the contained fluid, and is then dried, when it is ready for shipment to the rubber goods factories.

Recent chemical methods have been developed for concentrating and preserving latex so that not all latex is now coagulated on the plantations, and considerable quantities are shipped to the United States for commercial uses.

First U. S. Patent Using Latex

AN old U. S. Patent No. 73,287 dated January 14, 1868, to Bishop made waterproof paper for making collars, cuffs, envelopes, bank-note paper, wrapping paper by applying rubber latex to one or both surfaces of paper. The paper was then passed between heated rollers. Several sheets were also united together by latex and pressed between heated rollers.

Sponge Rubber from Latex

ACCORDING to Patent No. 1,156,184 dated October 12, 1915, to Schidrowitz and Goldsbrough, porous or spongy rubber is obtained by making it directly from rubber latex by coagulating the latter under conditions producing a porous

or spongy coagulum and by fixing the pores so produced by vulcanization.

A number of different examples are given of which the following is illustrative: Equal quantities by volume of latex and of a saturated solution of ammonium carbonate mixed together are heated in a water bath and one per cent by weight of finely divided sulphur stirred in. Coagulation may be induced by adding a sufficiency of acetic acid while stirring the mixture, and the containing vessel is then placed in a steam vulcanizer and cured for about one hour at 260° F., the quantity of acid and curing time and temperatures being varied according to the latex employed and to the nature of the sponge desired.

Hollow bodies may be formed by using suitable molds or by inserting suitable bodies into the latex prior to or during the process of coagulation; or the latex with or without the coagulant and vulcanizing agent and filling materials or the like may be poured or cast around such a body or bodies. Similarly, shaped bodies may be obtained by using suitably shaped molds for giving any desired shape to the exterior of the mass. Or, handles or other articles intended to serve as carriers and provided or not with grooves or other recesses may be dipped into the mass so that the substance will form upon such articles during the vulcanizing process. For instance, in making washing gloves, or like scrubbers, or rubber sponge bodies with a base, carrier, or binding medium of a textile fabric or other fibrous material, such fibrous material may be dipped into or passed through the treated or untreated latex so as to cause it to take up the desired amount thereof, and may then be treated according to any of the above described methods that may be suitable for its purpose. A useful application of this part of the invention consists in the manufacture of washing gloves from Turkish toweling and latex as described.

Waterproofing Fabrics

LATEX is particularly effective in waterproofing fabrics. In U. S. Patent No. 1,411,786 dated April 4, 1922, to Hopkinson the rubber latex containing one-third per cent ammonia which serves to prevent natural coagulation of the latex may be sprayed or flowed in proper quantities on the surface of traveling threads, yarns, or fabric; or the fibrous material may be led into and under the surface of a bath of latex, and the water of the latex driven off, either entirely or partially, by evaporation; or after immersion, the excess latex may be squeezed out between rolls and the fibrous material dried thereafter; or a roll of fabric or yarns may be wound on a suitable arbor with spacing devices between successive convolutions, and the entire roll submerged in a bath of latex. If the most complete penetration is desired, the process may involve placing the fibrous material in an air-tight chamber, exhausting the chamber of air, then admitting latex. This process may also be carried a step further by breaking the vacuum while the fibrous material is below the surface of the latex, and then applying fluid pressure to the latex. By whatever means the fibrous material has been subjected to the action of the latex, it is afterwards subjected to any desired step by which the water or latex fluid is eliminated. Ordinarily, this consists of the step of squeezing out excess moisture and then drying the fibrous material by the application of heat. The elimination of the water is carried out before vulcanization is undertaken.

If desired, vulcanization or other ingredients may be added to the latex before the fibrous material and the latex are brought together. Sometimes it will be desirable to add material such as dissolved glue or glycerine or oil adapted to soften the resultant rubber to the latex in the desired proportion, to obtain any desired modification of the action on the fibrous material resulting from the application of rubber latex alone. Oils and glycerine act to soften the contained rubber, while glue is a filling material sometimes desirable to use.

By this latex treatment the fibrous material has its interior impregnated with rubber and a thin layer of rubber on its outer surface connected with the interiorly contained rubber. After the latex treatment the fibrous material may be put through any additional process for the purpose of applying a thin sheet of rubber to its surface, such as any one or more of the processes of "spreading," "frictioning," and "skimcoating." Usually such will be the practice ordinarily followed.

Weftless Fabric

WEFTLESS fabric has been usually made by rubberizing parallel cords held under tension. Hopkinson in U. S. Patent No. 1,424,020 makes a weftless fabric utilizing latex. The cords are passed under tension in parallel relation through a bath of latex and they are then conducted over a series of drying drums. The production of weftless fabric will be covered more in detail in a separate article in the future.

Casein and Latex

LATEX has been combined with casein to form a composition for many purposes such as tires, mats, linoleum substitutes, flooring, pool and billiard balls, bowling balls, tennis balls, belting, shoe compositions, pavements, insulating materials, household and personal articles, chemical apparatus and equipment, buttons, flexible adhesive and coating, waterproofing compositions, gaskets, washers, bumpers, machinery parts, ebonite and vulcanite compositions.

According to U. S. Patent No. 1,437,487 dated December 5, 1922, to Biddle the value of using casein lies in its insolubility under certain conditions and in its flexibility when combined with non-evaporating substances like oils and tars. Casein combines readily with lime and other chemicals which have adhesive properties, and is especially useful in a composition used as waterproofing compositions. Moreover, they take very readily to vulcanizing in any of the present methods of vulcanization wherein pure sulphur, sulphur compounds, sulphur baths, and cold sulphur process are usually employed. Vulcanization tends to harden and thus to waterproof casein under certain conditions of temperature and pressure.

The following is an example of a waterproofing composition:

	Parts
Casein	100
Lime	25
Sodium fluorid	8
Water	350
Latex	300

Latex as a Protective Coating

ACCORDING to U. S. Patent No. 1,492,027 dated April 29, 1924, to Gardner, 100 parts of china clay and 100 parts of an opaque white pigment such as lithopone or titanium oxide are mixed together and preferably moistened with a small amount of an alkaline solution such as a 10 per cent solution of ammonia or a 5 per cent solution of caustic soda. The mixture of pigments is then ground together with rubber latex to which has been added a small amount of an alkaline agent, say one part of ammonia, or one part of a 5 per cent solution of caustic soda to ten parts of the rubber latex. The pigment and the latex are combined in suitable proportions to produce a product of the desired fluidity, for instance, to produce a paint adapted to be applied by means of a brush.

The product is stable and when applied to objects with a brush and dried, forms tough durable films of very high moisture resistance and protective properties.

Protecting Pipes

PIPES have been protected internally with latex as described in U. S. Patent No. 1,576,767 dated March 16, 1926, to Loomis and Stump. The latex is pumped through

the water pipes before or after assembly. The excess material is then drained away and air is blown through the pipes to dry and effect the final coagulation of the latex and its conversion into irreversible rubber. The latex is preferably vulcanized before application to the pipes but this vulcanization can, if desired, be readily obtained by incorporating with latex a quantity of sulphur, preferably colloidal, and then blowing hot air through the pipes to vulcanize the material. The latex may be vulcanized before application by merely incorporating sulphur in it and heating it before coagulation.

Latex in Paper Making

PAPER has been manufactured using latex containing 0.5, 1, 2, 4, and 5 per cent of rubber to the weight of dried paper while much more resinous latices have been successfully used to produce papers for special purposes containing as much as 10 per cent of coagulative material.

Paper containing rubber has a high tensile strength. The folding number, as determined by the Schopper folding machine, of samples of paper containing 0.5 per cent of rubber and vulcanized has reached 5,000 to 6,000. Without vulcanization, paper containing 2 per cent of rubber often has a folding number of 2,000 and over.

As described in U. S. Patent No. 1,500,500 dated July 8, 1924, to Kaye, the latex is added to the paper pulp after the latter has been beaten to the required extent for the quality of paper aimed at, and the quantity of latex or latices added is in proportion to the quality of the paper to be made and the nature of the fibers, and other materials used in the composition of the paper. After thoroughly mixing the latex with the pulp, in the beater, a coagulative agent is added, such as acetic acid, formic acid, or any other suitable organic or mineral acid, or small quantities of mineral salts.

When a satisfactory coagulation has been effected, the contents of the beater are transferred to the cistern or pulp-holding tank of the usual paper-making machine and run through the machine in the ordinary manner. The paper may be sized in the usual manner, before or after the addition of the rubber, gutta, or balata-containing latices. The dried paper can afterwards be vulcanized by any suitable process.

Match Composition

THE ordinary binding material used in match head composition is animal glue. This is a hygroscopic substance so responsive to atmospheric moisture that match heads soften and deteriorate under exposure thereto, thus preventing the ignition of the heads and frequently causing them to fall off or become detached from the sticks in attempts to strike them or light the matches.

A match head is made according to U. S. Patent No. 1,529,322 dated March 10, 1925, to Schapiro, with a composition containing rubber latex, upon elimination of the water from the composition, is nearly perfectly moisture-proof, since rubber will greatly resist moisture.

The following formula is used:

	Parts
Rubber	20
Sulphur flour	10
Rosin	10
Ground glass	40
Chlorate of potash	50

Lubricating Compound

U. S. Patent No. 1,519,547 dated December 16, 1924, to Marquette relates to a compound for use in lubricating or preventing adhesion during vulcanization of rubber surfaces, particularly intended for coating rubber or rubber surfaced annular pressure bags on which tires, particularly of the cord type, are vulcanized, so that the bags and tires will not stick together during vulcanization.

The compound consists of: liquid latex 7½ gallons, water 150 gallons, mica 170 pounds, and ammonia 1 pint. The latex in the above example has a rubber content of 30 to 35 per cent. The ammonia is a one to one solution of concentrated ammonia in water.

Dipping in Latex

A RESTRICTED class of articles has been fabricated from rubber cements, that is solutions of crude rubber in benzol or similar solvent directly by dipping. An example of such procedure is the formation of surgeon's gloves by dipping a form into a rubber cement, removing the form, allowing the solvent to evaporate to form a thin coating of rubber on the form and alternately dipping and drying the form and its adhering coating until a sufficient thickness of rubber has been built up, whereupon the glove is stripped off and vulcanized. Approximately five alternate dippings and dryings are employed for the fabrication of the glove in this manner requiring approximately one day for the completion of the process and a number of handling or equivalent mechanical operations in moving forms into and out of the cement.

One of the objects of the U. S. Patent No. 1,542,388 dated June 16, 1925, to Hopkinson and Gibbons is to provide a process for employing rubber latex in which fabrication of articles may be carried out by one dipping or by fewer dippings than heretofore practiced with cements.

A surgeon's glove for example is made as follows: A form in the shape of a hand, made of porous material, unglazed porcelain or chinaware, is immersed in latex containing approximately 40 to 50 per cent rubber and allowed to remain submerged to the proper depth at ordinary room temperature for an interval of time corresponding to the thickness of the rubber desired. Fifteen or thirty minutes is sufficient for the manufacture of a surgeon's glove. The form is then withdrawn from the liquid, allowed to drip and the rubber thereupon is dried at room temperature or at a slightly elevated temperature.

The withdrawal of water from the mass of latex adjacent the form is effected through the pores of the porous material and causes a segregation or collection of thickened latex adhering to the form. This withdrawal of water takes place toward the interior of the form while the latter is immersed and upon withdrawal of the form elimination of water from the adherent mass takes place not only towards the interior but also by ordinary exterior evaporation. The drying of the glove which has a thickness when dry of .012-inch requires approximately one hour.

The glove so produced is vulcanized by dipping in the following solution: benzol 100 parts by weight, zinc butyl xanthogenate 3 parts by weight, dibenzylamine 3 parts by weight, and sulphur 1 part by weight. An immersion of one or two minutes at room temperature followed by air drying and vulcanization for one hour at 212° F. produces a satisfactorily vulcanized article, or after dipping if the glove is allowed to stand for approximately three weeks, vulcanization is satisfactorily accomplished. The glove is then treated with talc and stripped from the form in the usual way. In place of the vulcanization process mentioned sulphur-chloride-vapor-vulcanization may be employed or vulcanization by dipping in a solution of sulphur chloride may be used with satisfactory results.

Shells for Dynamite Cartridges

COMMERCIAL dynamites are, as a rule, put up in paraffin paper cartridges, or shells, of various diameters and lengths. These shells, being composed of carbonaceous matter, take part in the explosion of the dynamite as one of its ingredients and thus should be considered a part of the dynamite composition. Dynamites in their, usually, most desirable forms have a little more than enough oxygen in their composition to provide complete combustion to CO_2 of all the car-

bonaceous matter in the dynamite mixture, exclusive of the shells. Consequently the presence of the paraffined paper shells in such cases tends toward the presence of the poisonous carbon monoxide in the gases resulting from the explosion. This is particularly objectionable in underground work, where the ventilation is often insufficient.

U. S. Patent No. 1,550,670 dated August 25, 1925, to Brandt overcomes this objection by using shells made from a rubber or latex-treated paper. Rubber and latex do not require so much oxygen for complete combustion as does paraffin, and, besides, the weight of rubber or latex required to give shells the desired water and nitroglycerine-resistant properties is less than the weight of paraffin in paraffined paper shells.

Rubber Tubing from Latex

TUBULAR articles and tubing of various sorts are manufactured by extruding compounded raw rubber into the desired shape and later vulcanizing in molds or in talc or in an atmosphere of steam under pressure, and usually the tubular articles of larger size, such as inner tubes, are wrapped in wet cloth prior to vulcanizing. Another method of making such articles is to wrap a flat sheet of compounded rubber around a mandrel or form, lapping the edges of the sheet to form a seam. Inner tubes and some of the larger sizes of hose are usually made by the extruding process, and vulcanized on a pole or mandrel. After vulcanizing, inner tubes are made by trimming off to the desired length, skiving the ends and cementing together. In the manufacture of tubing by the extrusion process it is unavoidable that the rubber must be rather severely milled in order to mix the compounding ingredients therewith and to bring the batch to the proper plasticity for extrusion.

The process described in U. S. Patent No. 1,551,553 dated September 1, 1925, to Gibbons and Koenig consists in continuously or intermittently streaming latex into a coagulant, partially coagulating the latex, and forming a tube of freshly coagulated rubber containing a core of latex, washing off the coagulant if necessary or desired, and removing the liquid or latex core by confining the tubing externally and blowing or otherwise displacing the contained latex. If a vulcanized tube is desired, it may be obtained by either compounding the latex with suitable filling and vulcanizing ingredients or by subjecting the tubing to vulcanizing solutions or vapors or to solutions containing vulcanizing ingredients with or without heating as required.

Another U. S. Patent No. 1,570,895 dated January 26, 1926, to Hopkinson and Gibbons, a tubular stream of latex rubber solution is extruded into a coagulating bath, simultaneously forming within the tubular stream a core of a coagulating material, and recovering a tubular body of rubber continuous with the stream.

Referring to Figure 1 of the illustration on page 63 a series of superposed troughs are shown enclosed in a housing or chamber. Outside the upper right-hand corner of the housing is a supply tank to which is attached air-injection means for forcing the rubber dispersion from the tank through the delivery pipe and nozzle which are shown at the extreme right of the topmost trough labeled "acetic acid bath." Directly beneath the topmost trough are three superposed troughs which contain glycerol at varying temperatures. Below the lowermost of the glycerol troughs is a water bath and beneath this a drying conveyer. Directly below the drying conveyer is placed a series of two troughs containing cold vulcanizing solution and at the end of the lowermost of these vulcanizing troughs is an alcohol bath. Below the alcohol bath are shown three drying conveyers, and directly beneath the last of the drying conveyers are two glycerol baths. At the extreme bottom of the apparatus are a water bath and drying conveyer.

Figure 2 shows one form of nozzle with the tube issuing therefrom, and partly cut away to show the inner core or coagulating material. The coagulating material is supplied through a nozzle which is concentrically located within the latex extruding nozzle.

In carrying out the invention, latex which may or may not contain compounding ingredients and vulcanizing ingredients is fed at a predetermined approximately constant rate through the nozzle situated at the right-hand end of the uppermost trough, the acetic acid bath, and at the same time a stream of acetic acid is supplied to the nozzle located concentrically in the latex nozzle. When the extruded latex strikes the acetic acid bath, it coagulates on the outside as well as on the inside, thus producing a tubular structure of coagulated rubber, and the formation of the tubular structure is continuous as long as the supply of rubber dispersion is maintained. In the illustration on page 63 the tubing is represented as being carried through the acetic acid bath, over rollers down into the glycerol baths situated below, through these and into the water bath, and thence to a drying conveyer. From the drying conveyer the tubing then passes through a vulcanizing solution and an alcohol bath to a second set of drying conveyers which deliver the tubing into hot glycerol where vulcanization takes place. From the hot glycerol troughs the tubing passes through a water bath to wash off the glycerol and thence to a drying conveyer and out of the apparatus as finished vulcanized tubing in a continuous length.

By properly controlling the peripheral speed of the rollers and drying conveyers, the passage of the tubing through the various troughs and over the several conveyers can be continued at exactly the same rate as the latex or dispersion is delivered into the coagulating bath.

Floor Coverings

THERE is a demand for an inexpensive but durable floor covering having the general properties of a carpet and adapted for use in places where it is subjected to hard and rough usage, such for instance as runners in hotels and theatres, floor coverings for automobiles, and the like. In order to be practical for such uses, a floor covering should be inexpensive to install and replace, should be strong and durable, and if a binder or sizing is employed, it should be moisture-proof and have strong resistance to any conditions which tend to deteriorate the binder.

According to U. S. Patent No. 1,574,896 dated March 2, 1926, to Johnson, animal hair, preferably that of cattle, is formed into felt sheets in the usual manner, either by the simple fleting method, the needle-punching method, or the fulling method. The thickness of the sheet thus produced will depend largely upon the use to which the finished product is placed. If the finished product is to be used as a floor covering of the kind mentioned above, the felt sheet should be made about 1/8 to 3/16 of an inch thick. The felt sheet is then impregnated with a special binder. The binder may be placed in a suitable trough and the felt drawn through it by means of rollers which also serve to squeeze out the excess binder. The impregnated felt is then dried in a suitable drier until it is about 90 per cent dry, and then passed through either a hot plate press or a hot roller press.

The binder may be made as follows: About 4 pounds of the tapioca adhesives are dissolved in 3 gallons of water and then heated to a point where it becomes like jelly. This is cooled, and then 1/3 of a gallon of latex is added. It is also desirable to add about 6 ounces of 16° ammonia to prevent coagulation of the latex on the squeeze rolls and about 6 ounces of penetrating oil such as "halo" oil commonly used in the automobile tire industry for causing rubber to penetrate a fabric.

(*To be continued.*)

The Manufacture of Belting

THE following abstracts of United States patents for manufacturing laminated belts made by cohering layers of fabric conclude the article that was published in INDIA RUBBER WORLD, August 1, 1929.

27. Hale, 694,099. Feb. 25, 1902. A belt-folding machine has bearings for the roll of material to be converted into a belt, a take-off roll that rests on the roll of material and descends by gravity as the latter decreases in size, and guides to direct the movement of the take-off roll, pressure rolis and folding rollers, an adjustable bracket adapted to carry a seam-covering strip, a solvent tank through which the strip passes.

28. Harley, 757,919. Apr. 19, 1904. The method consists in interposing a metallic band between a plurality of plies of belting material, cementing the plies together and before the cement is hardened, stitching the plies together, whereby the stitching takes up cement and is cemented in the stitch-holes.

29. Thomas et al, 764,831. July 12, 1904. The process consists in sweating the hide to loosen the hair, mechanically removing it, slicing off the grain, drying, and cutting the hide into strips, and securing thereto a surfacing of suitable material such as rubber or duck.

30. Moore, 824,189. June 26, 1906. Textile belting is prepared by wetting, stretching while wet, drying under tension, stretching and setting the fibers, and impregnating it with rosin oil and an oxidizing oil.

31. Maxwell, 1,041,130. Oct. 15, 1912. A laminated belt composed of three plies of equal width is made continuously by applying cement to a strip of textile fabric, then drawing the strip through consecutively graded and suitably formed apertures, folding one side of one-third of the width of the strip upon the central portion thereof, and thereafter folding the opposite side of one-third of the width of the strip upon the first side, and finally pressing the folded plies together.

32. Wright, 1,123,459. Jan. 5, 1915. In a belt-making machine, edge-folding and doubling means progressively act on a belting strip to edge fold and double it as the strip is drawn through.

33. Gray, 1,129,666. Feb. 23. 1915. A continuous cord is helically wound on suitably spaced rollers to form the desired width of belt, the ends of the cord are temporarily secured, the assembled loops are removed, embedded in rubber, and vulcanized under pressure.

34. Young, 1,148,883. Aug. 3, 1915. The process consists in prestretching a fibrous transmission element, impregnating it with a gelatinous composition to retain it in such stretched condition, drying the treated fibrous element, and then cementing a traction-surfaced element thereto.

35. Hathaway, 1,183,194. May 16, 1916. The process consists in weaving textile fabric comprising yarn and a proofing substance as a core about which the yarn is spun, and subjecting the fabric to heat and pressure whereby the cores are pressed outwardly for impregnating the yarn.

36. Welton et al, 1,201,406. Oct. 17, 1916. Aprons for rubber mixing mills are made by winding upon each edge portion of a drum, a strip of rubber-treated material, winding a plurality of convolutions of rubber-treated material to overlap the strips, directing the strips to embrace the edge portions of the convolutions, and vulcanizing the product on the drum.

37. Price, 1,211,350. Jan. 2, 1917. Making conveyer belts is done by applying a wear facing of rubber to a strip of fibrous material and forming a convex surface of approximately uniform thickness thereon.

38. Sloper, 1,223,742. Apr. 24, 1917. Endless bands are made by wrapping a strip of fine canvas around a circular "former," spirally winding a layer of threads on the canvas, but reducing the thickness of the layer by omitting threads at predetermined zones along which it is desired the bands shall crease, and finally applying a layer of canvas on the outer layer of threads, with a thin coating of adhesive between them.

39. Lear, 1,228,792. June 5, 1917. A belt is formed by uniting the ends of two or more strands of yarn to the body portion of said strands, thereby determining the length of the belt, and then continuing the strands along the sides of the belt so started, stitching them together until the other ends of the strands are reached, and securing the ends to the body portion of the belt at the side opposite the connection of the first-mentioned ends.

40. Bradshaw, 1,235,425. July 31, 1917. The method consists in calendering a plurality of fabric plies, sizing the surfaces with a cement, the essential ingredient being a cellulose ester, drying the sizing while the plies are under tension, and cementing them together with such a cement.

41. Gammeter, 1,277,711. Sept. 3. 1918. Making a flat, endless belt consists in laying a rubberized fabric cover-strip on the periphery of a forming support, winding a rubberized cord thereon under strong tension in a series of adjacent convolutions, closing the cover-strip over the outer side of the body of cord strands, and vulcanizing while still under tension on the support.

42. String, 1,279,036. Sept. 17, 1918. Textile belting is made by folding the margins of a textile strip toward each other as primary folds, folding the primary folds toward each other for forming intermediate folds along creases, passing stitching through the intermediate folds and the body of the strip, then folding the body portion of the strip, inclosing one of the faces of all stitchings, passing the stitching through the intermediate folds, and subjecting the product to edge pressure.

43. Clark, 1,286,229. Dec. 3, 1918. A suitable sizing solution is applied to flexible material, subjecting the material to constant tension while being driven at constant speed in an endless path during the drying period of the sizing solution.

44. MacPherson, 1,305,141. May 27, 1919. Folding means are used to keep the parts of the fabric coated with adhesive apart, and then to bring and adhere the parts at the edge together while the rest of the strip is not acted or pressed upon by dies across its width.

45. Gates, 1,281,153. Reissue No. 14,875. June 8, 1920. The process consists in cutting rubberized woven fabric into pieces whose warp and woof form oblique angles to their length, connecting them to form a long sheet, winding it in the direction of its length to form an annular belt composed of superposed layers, the fabric being placed under tension during the winding operation to eliminate superfluous elasticity, the ends of the sheet being secured to the body of the belt by raw vulcanizable material, vulcanizing the belt while on the core, and finally subdividing the belt to form a series of belts of uniform length.

46. Gingras, 1,351,901. Sept. 7, 1920. Apparatus for treating fabric consists of a plurality of rollers supporting the fabric in endless arrangement with a portion of the fabric between rollers forming a loop between the main runs, a roller disposed in the loop and engaging the bight, means tending to press the roller against the bight of the loop to tension and stretch the endless fabric, a solution tank, and means for deflecting the fabric into the solution.

47. Gates, 1,354,738. Oct. 5, 1920. Endless belts are made by placing rubberized woven fabric in a circular mold so that the warp and woof form oblique angles to the length of the mold, arranging rubberized material in the mold outside of the fabric so that it shall be inelastic in the direction of the length of the mold, and placing rubberized woven fabric outside of the material so that the warp and woof form oblique angles to the direction of the mold. See group illustration.

48. Czaran, 1,362,604. Dec. 21, 1920. Means are employed for forming ends of the belt to the desired shape and means for holding the ends under pressure while the cement is setting.

49. Lambert, 1,370,597. Mar. 8, 1921. The method consists in taking alternate layers of rubberized fabric and cords, laying a layer of cords between opposite layers of fabric strips, and stretching the cords to their approximate limit of elongation while being laid, and vulcanizing the whole while the cords are being held stretched.

50. Gates, 1,400,538. Dec. 20, 1921. A cylindrical belt member is formed from a sheet of rubberized material by winding around a drum to give the member the required number of superposed layers, and vulcanizing while on the drum, thus producing a spiral kerf therein to form a belt of the required length and width.

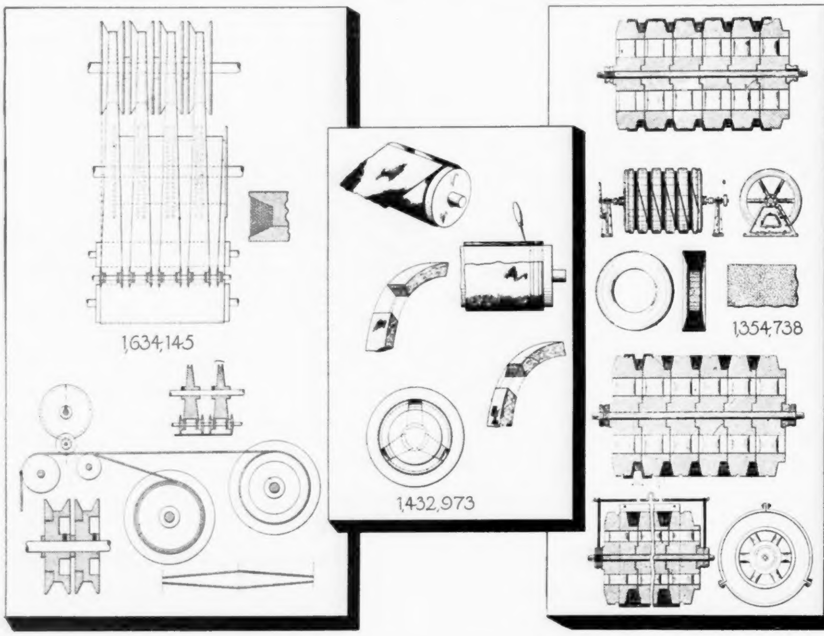
51. Lambert, 1,412,309. Aug. 11, 1922. A continuous cord is wound helically on a circular former to form the belt of the desired width and length, the cord being subjected to elongating strains while being laid to such an extent that the cord is stretched to its approximate limit of elongation. The cord may be rubberized

before being laid, after which the assembled loops are vulcanized together while on the former.

52. Lambert, 1,412,310. Apr. 11, 1922. The method of making a flat, endless belt consists in laying a rubberized fabric cover-strip on a forming support, winding a rubberized cord thereon under tension in a series of convolutions, closing the cover-strip over the body of cord strands, and vulcanizing on the support while under tension.

53. Gingras, 1,419,842. June 13, 1922. Making belting from a fabric belt comprises saturating it with cement and holding the saturated belt in tension while the solution is drying, shifting the belt longitudinally, and applying a frictional surface to the same without removing the tension.

54. Delzell, 1,432,973. Oct. 24, 1922. The method of making a series of endless, laminated V-belts comprises winding into tubular form a sheet of rubberized, bias-cut fabric, a sheet of rubberized, straight-cut fabric, and another sheet of rubberized bias-cut fabric, cutting the tube into rings of trapezoidal section, turning inside out the rings which have their narrower peripheries outermost, stretching the rings of both sets and vulcanizing them in stretched condition with their wider peripheries outermost. Illustrated.



55. Fisher, 1,438,370. Dec. 12, 1922. The process consists in cutting into strips a sheet of fabric treated with a vulcanizable substance the threads of which run obliquely, folding the longitudinal edges of the strips upon themselves, winding the folded strip upon itself with its folded edges facing upwardly in a plurality of layers, placing a flexible core upon the upper layer between its edges, winding a similar strip in a plurality of layers upon the first strip with its folded edges facing downwardly, and vulcanizing the continuous band thus produced.

56. Poulin et al, 1,452,704. Apr. 24, 1923. Forming a belt is done by overlapping the ends of a base strip, applying layers of batting to the opposite sides of the strip over the ends, and forcing portions of the batting layers through the base strip.

57. Cobaugh, 1,478,025. Dec. 18, 1923. A driving belt is made by cutting the opposite ends of a fabric sheet, forming a plurality of diagonal joints and interposed longitudinal joints which register when the ends are placed together, placing the ends together, stitching the registering portions of the diagonal joints, folding the sheet transversely, stitching the folded sheet on both sides of the longitudinal joints, folding the sheet transversely, and stitching the folds together.

58. Callan et al, 1,490,454. Apr. 15, 1924. This gives a process of making a belt composed of a plurality of plies of textile, the plies in a relatively long intermediate section being cemented together with a relatively strong cement, and in relatively short end sections being cemented with a relatively weak cement.

59. Murray, 1,494,075. May 13, 1924. The process consists in forming a tube of rubberized fabric, placing on the surface a series of reenforcing members, placing a rubber binder on the members, then rolling one edge of the fabric from one end of the tube toward the other end.

60. Kimmich, 1,503,453. July 29, 1924. This method comprises treating a plurality of fabric layers with a vulcanizable material, superposing the treated layers, treating fabric upon one side with a vulcanizable material, applying it to the superposed layers with its untreated side exposed, vulcanizing the body thus formed and applying a coating of nitrocellulose to the untreated fabric surface.

61. Brucker, 1,510,449. Sept. 30, 1924. The method consists in applying a band of bias-cut friction fabric to the toothed periphery of an endless former with the side edges of the fabric projecting, filling the recesses with rubber compound, winding on the compound rubberized cord-tension material, folding the edges of the bias fabric around the tension material, and vulcanizing the whole together.

62. Guttin, 1,546,929. July 21, 1925. Making round belting from a strip of textile fabric impregnated with cementing material comprises progressively heating and coiling the fabric about one of its edges while hot, thereafter subjecting the fabric to compacting operations producing a solid body, reheating the belting, and finally shaping while in a heated condition.

63. Freedlander et al, 1,562,548. Nov. 24, 1925. A belt is made by mounting a vulcanized cylinder of belt material on a cutting drum, cutting triangular-shaped annular sections from it, applying cement to its sidewalls, stretching the sections to size on a form under heat, joining the sections to one another with the apex of one triangular section between the bases of the adjoining sections, and vulcanizing the assembled sections as a unit to form a belt.

64. Falor, 1,579,293. Apr. 6, 1926. Flexible endless, laminated driving belts are made by progressively immersing a continuous, flat strip of woven fabric in rubber cement, wiping off excess, drying, winding the coated strip convolutely upon itself, and then vulcanizing the belt.

65. Freedlander 1,591,303. July 6, 1926. Making endless rolls of belting material from which to form driving belts consists in fabricating the material for the compression member, for the neutral member, and for the tension member in separate sheets. Then wind these sheets on a superimposed form, and vulcanizing the roll which is cut into individual belts.

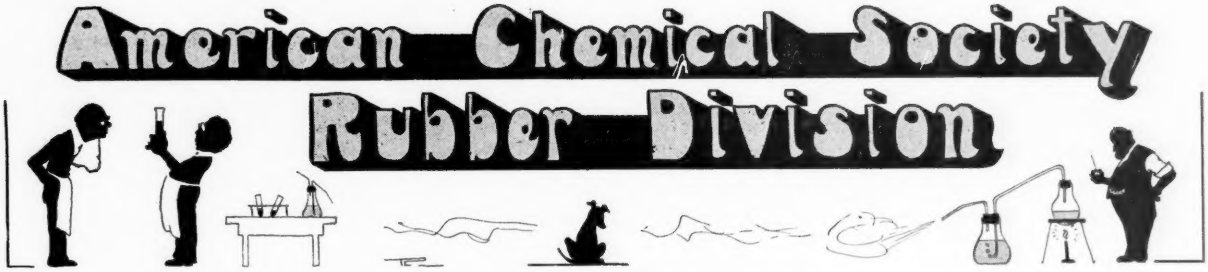
66. Gammeter, 1,610,942. Dec. 14, 1926. This method comprises making a fibrous cord grommet, stretching it by rolling on a conical surface from the smaller to the larger part, applying a cover including rubber, and molding and vulcanizing the resulting product.

67. Freedlander, 1,611,829. Dec. 21, 1926. Making an endless roll of driving belt material from which individual belts are to be cut consists in fabricating material for the compression member, for the central member, for the tension member; prestretching the central and tension members; winding on a form the material of the compression member, for the central member, for the tension member, and in vulcanizing the roll.

68. Freedlander, 1,611,830. Dec. 21, 1926. This consists in fabricating the whole material of rubber mixed with fiber, the strands of which are placed substantially crosswise. Then wind the material on a suitable form into a roll of belting and vulcanize it.

69. Hathaway, 1,634,145. June 28, 1927. The manufacture of laminated belts consists in severing a sheet of belting fabric into relatively narrow strips longitudinally tapered from end to end, and winding the tapered strip into a laminated coil with the narrow end inside, thereby producing a laminated belt of tapered cross section. See group illustration.

70. Teisher, 1,676,845. July 10, 1928. This method comprises applying a plurality of right and left hand twisted rubberized cords to a band of rubberized fabric supported in distended position, enclosing the cords within the fabric, removing the band from its support to relieve the tension, and vulcanizing under no tension.



Atlantic City Meeting

THE Seventy-eighth Meeting of the American Chemical Society was held at Minneapolis, Minn., the week of September 9. The Rubber Division, A.C.S., however, held its corresponding fall meeting on September 26, 27, and 28 at Atlantic City, N. J., with the New York Group as host. The headquarters of the division was at the Chalfont-Haddon Hall Hotel, where all the sessions and the banquet were held.

The business meeting of the division and the election of officers for the ensuing year preceded the reading of papers at the first session, and concluded with the acceptance of the report of the Physical Testing Committee.

The scientific program included ten papers and one report. These were all of much value and interest as may be seen by the abstracts printed below. The social program for men began Thursday afternoon with golf, tennis, and bathing, followed by the banquet of the division. The attendance at the latter event, which was marked by a number of interesting speeches and excellent entertainment features, was large and enthusiastic. An honored guest of the occasion was W. F. V. Cox, secretary of the Institution of the Rubber Industry, London, England.

A special program for the ladies included a dinner Thursday evening followed by a special entertainment, dancing, and a theater party. On Friday afternoon a tea and bridge took place for ladies and gentlemen. On both days recreations, lunches, and rolling-chairs on the boardwalk were on the ladies' program.

The chairman of the New York Group and his committee are to be congratulated on the successful presentation of the events scheduled in the excellent scientific and social programs provided for this meeting.

Abstracts of Papers

Carbon Black II. The Role of Oxygen. Following the work of Carson and others on adsorption in connection with carbon black, work has been done, studying adsorption with reference to its influence on the quality of carbon black in rubber. Previous work has somewhat indicated the role which oxygen plays in connection with the properties of carbon black. This paper will attempt to extend our knowledge in this respect. It is expected to show more exactly just how the oxygen is combined physically and chemically with carbon black. Numerous examples of its behavior under conditions of chemical contact, variation of temperature and pressure will be given. Some data on the equilibrium condition by which oxygen is either added or removed from carbon black is included. C. R. Johnson.

A Simplified Type of the Goodrich Plastometer. A description of a simplified type of the Goodrich plastometer, developed for research and control, is given. The complete instrument consists of: (1) an anvil upon which the test piece is mounted, (2) a loading plate through which compressive forces are applied by means of (3) a loading tube and weight, (4) a gage for indicating the height of the test piece during compression and recovery, (5) a furnace for maintaining constant temperatures up to 150° C., (6) a cutter for the preparation of the test pieces. Compression and recovery intervals are equal (30 seconds). Softness, retentivity, and plasticity are calculated from the values of the initial height, h_0, the compressed height, h_1, and the recovered height, h_2, according to the following equations:

$$\text{Softness, } S, = (h_0 - h_1) \div (h_0 + h_1);\ \text{Retentivity, } R, = (h_0 - h_2) \div (h_0 + h_1);\ \text{Plasticity} = S \times R = (h_0 - h_2) \div (h_0 + h_1)$$

Typical plasticity data for crude and compounded rubber, including temperature coefficients, are presented. The relation between softness and retentivity for a large number of stocks is pointed out, and the effects of departures from standard testing conditions are discussed. E. Karrer, J. M. Davies, and E. O. Dieterich.

Applications of Dunn's Viscosity Equation to the Study of Rubber. It is shown that the reversible changes of viscosity with temperature for rubber solutions of various concentrations in eight different solvents may generally be represented by the equation: $\log \frac{1}{n} = \frac{A}{T} + B$, derived by Dunn for pure liquids. This holds even where the change of viscosity with temperature is relatively much different for the solution and the solvent. Some inferences, from these results, relative to the structure of rubber are indicated. The reversible changes of viscosity with temperature are probably less dependent upon a change in the polymerization of the rubber than upon a change in the thermal energy of the molecules. The irreversible changes caused by milling, heating to higher temperatures, exposure to light, etc., may be interpreted from the changes in the constants of the viscosity equation. W. F. Busse and E. Karrer.

A Method for Estimating the Degree of Penetration of Rubber into Fabrics. To examine the extent of penetration of rubber compounds into fabrics, the composite rubber-cotton structure is first cured to the hard rubber stage by the use of polysulphides. After sectioning, the cotton fibers are dissolved by means of concentrated sulphuric acid, leaving the hard rubber matrix which may be studied microscopically. Typical photomicrographs of a number of fabrics are shown. E. O. Dieterich.

Thermodynamics of Stretching of Vulcanized Rubber. The first and second laws of thermodynamics are applied to the stretching of vulcanized gum stocks. Stress-strain curves for rubber usually exhibit considerable hysteresis, which precludes the application of the second law. A method of obtaining reversible or equilibrium stress-strain curves is described, which makes possible the application of the second law. These stress-strain curves are identical for different cures, whereas

the usual curves make the rubber appear stiffer with increased cure. This is an additional link in the evidence that vulcanization affects the plastic properties to a greater extent than the elastic properties. The equilibrium stress-strain curves show the rubber to be stiffer at higher temperatures. This is in qualitative agreement with the second law. The stress strain curves which show the rubber to be stiffer at lower temperatures are not compatible with the second law. The suggestion has been made that the retraction of stretched raw rubber is analogous to production of work by steam expanding in contact with water. This analogy has been found to be true for vulcanized rubber. Heat is absorbed not only because of the work done by the rubber but also because of energy absorbed in retraction. Roscoe H. Gerke.

Flexing Test for Tire Carcass. A description is given of the laboratory flexing test as applied to tire carcass materials. The preparation of samples, methods of curing, and details of testing are discussed. In order to obtain reliable results the weight and gage of skim coat, compression produced by cure, as well as the mechanical details of testing must be kept constant within certain limits. W. A. Gibbons.

The Effect of Temperature, Pressure, and Humidity on the Permeability of Rubber to Air. Although the permeability of rubber to hydrogen has been studied considerably in connection with balloon fabrics, the permeability to air has been given very little attention. The present paper describes an apparatus used in a study of permeability of rubber stocks to air, and gives the results of the investigation of the effect of certain experimental conditions on permeability. The apparatus used was so arranged that the rubber sample to be tested served as a membrane separating two air chambers. The air pressure in one chamber was increased considerably above atmospheric, while that in the other was decreased to slightly less than that of the atmosphere. The passage of air through the membrane was followed by means of a manometer attached to the low pressure chamber. The permeability of rubber to air was found to be approximately proportional to total pressure. The temperature coefficient of permeability is very high, thus indicating that it is desirable to check tire pressures much more frequently in summer than in winter. Although moisture is capable of affecting the permeability slightly, the effect of the moisture in the atmosphere is ordinarily almost negligible. V. N. Morris and J. N. Street.

Rate of Cure of Reclaimed Rubber II. In a previous paper by Shepard, Palmer, and Miller of this laboratory, *Ind. Eng. Chem.*, 20 (1928), p. 143, data were presented which indicated that alkali added to a "water-cooked" reclaim to the extent that it is present in an "alkali-cooked" reclaim, did not bring the rate of cure of the "water-cooked" reclaim up to that of the "alkali-cooked." On the basis of these results the conclusion was reached that the alkali content of reclaim was only partially responsible for its rapid rate of cure. The work recorded in this paper covers additional data on this point. Extraction of "alkali-cooked" reclaim with water for a period of sixty days extracted three times as much alkali as was found by the ordinary alkalinity control test (four hours). Adding this amount of alkali in glycerine as a carrier to "water-cooked" reclaim brought the rate of cure up to that of the "alkali cooked." F. L. Kilbourn, Jr.

The Aging of Vulcanized Rubber Under Varying Elongation. A. A. Somerville, J. M. Ball, and W. H. Cope.

Akron Meeting

The second 1929 meeting of the Akron Group of the Rubber Division, A.C.S., will be held on October 14 in the K. of C. Club, 282 W. Market St., Akron, O. K. D. Smith, of The B. F. Goodrich Co. is in charge of the program and through his efforts and acquaintance in the trade a number of experts have consented to appear on a program dealing exclusively with problems relating to tire design.

J. G. Swain of the Firestone Steel Products Co. will discuss "Rims and Their Relation to Tires." The subject of the second paper, by V. L. Smithers, of Smithers, Inc., will be "Present Tendencies in Tire Design and Construction." The third subject will be "Indoor and Outdoor Testing of Tires," presented by J. C. Sproull of The B. F. Goodrich Co. Certainly no wide awake technologist or engineer can afford to miss this interesting group of papers.

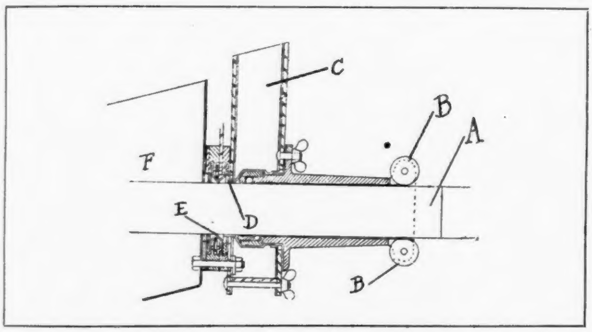
Since vacations are over and summer activities at an end, preparations are being made for the largest turnout in the history of the group.

Los Angeles

An interesting talk on "Carbon Blacks" was given by C. R. Johnson, of the Godfrey L. Cabot Co., at the eighth meeting of the Los Angeles Group of the Rubber Division of the American Chemical Society at the Pollyanna Tea Room, 2228 W. Seventh St., Los Angeles, Calif., on Friday evening, Sept. 20. The talk and the general discussion that followed were preceded with a dinner. A large attendance was a feature.

Latex Made Inner Tubes[1]

THE following brief account outlines a method for making inner tubes direct from concentrated latex or aqueous dispersions of rubber. The operation is conducted as follows: A mandrel is coated by passing it through a bath containing the rubber dispersion, means being provided for spreading the deposit and regulating its thickness. As shown in the illustration, the mandrel *A* guided by rollers *B* is drawn up a slope through the latex bath *C* where it is coated with latex cream issuing from an opening *D*. The coating is spread by a rubber shutter *E* adjustable to vary the thickness or to prevent deposition on a selected part. The mandrel then passes through a dehydrating and setting bath *F* containing, for example, a hot concentrated solution of ammonium acetate. The tube, when formed, may be vulcanized before removal from the mandrel.



Apparatus for Making Tubes

Tubes made by this process are not only seamless but possess all the inherent strength and other physical properties of pure rubber or the compounded latex or water dispersion. Grain effect is also eliminated, which is a safeguard against splitting of the tube in service.

[1] British Patent No. 312,257, July 17, 1929.

Editor's Book Table

Book Reviews

"Official American Textile Directory—1929." Compiled by *Textile World*, Bragdon, Lord & Nagle Co., Tenth Ave. at 36th St., New York, N. Y. Office edition, stiff covers, thumb indexed, 6¾ by 9⅜ inches, 1,097 pages. Travelers' edition, flexible covers. Vest-pocket size, Mill Section only, 3 vols. Special copyrighted maps showing cities and towns with textile mills.

This annual directory contains 7 sections listing over 10,000 American, Canadian, and Mexican concerns in every branch of the textile industry. Part I is a complete directory of mills: cotton, woolen, knitting, silk, flax, and jute; also dyeing and finishing works, bleacheries, print works, etc.

Full information is given about almost every mill, viz.: name; officers, agents, superintendent, buyer or purchasing agent; character of goods made; machinery equipment, i. e., number of sets of cards (or combs), number of spindles or looms; whether it uses steam, water, or electric power; whether there is a dye house or not; selling agents or if it sells direct. In this section all the mills in one place are arranged under the head of that town, but so designated by boldface letters that the type of mill is determined at a glance.

Part II, Raw Material Section, lists all raw-material dealers and brokers. Part III, Yarn Trade Index, classifies manufacturers with sizes and form of yarn spun; also yarn dealers and commission merchants with kinds of yarn handled. Part IV, Commission and Dyeing Section, classifies mills doing dyeing, bleaching, finishing, printing, mercerizing, etc. Part V, Classified Lists of Cloth Manufacturers, according to kind of goods made. Part VI, Selling Agents, includes selling agents, converters, dry goods commission houses, export houses, and cotton goods brokers with kind of goods handled.

Every one interested in any phase of the textile industry will find this directory a ready reference and valuable guide.

New Publications

"Cast Steel and Iron Gate Valves for Steam, Gas, Oil, and Water." This illustrated catalog is issued by the Pittsburgh Valve Foundry & Construction Co., Pittsburgh, Pa., as Bulletin No. 100. It is compiled for the information of engineers and the power-using public. Its 60 pages of data and illustrations relate to gate valves for low and high pressure and for field and line service for oil and gas. The book is well indexed for ready reference.

"Cotton in the Rubber Tire and Tube Industry" by Herbert A. Ehrman, Textile Division, is Bulletin No. 6 in the New Uses for Cotton Series, which deal with the possibility of increase in the use of cotton products, issued by the Department of Commerce, Bureau of Foreign and Domestic Commerce, Washington, D. C. This twelve-page paper booklet treats of the various uses cotton is put to in the tire industry, ranging from tire casings to the cotton gloves the worker wears for protection. The data are supplemented by tables and a diagram.

"Dechets et Régénérés" is a new French monthly publication devoted exclusively to the rubber waste and reclaimed industries, and it aims to keep technicians and manufacturers fully informed of the progress being made in these industries. The first number, dated June, 1929, contains a translation of the article on reclaimed rubber by E. G. Holt, which appeared in the May issue of the INDIA RUBBER WORLD; the first reply, by Walter Hutchinson, to an inquiry on the use of reclaim; and the first instalment of an article on the rational employment of wastes and reclaim. The periodical is published at Rue des Saussaies 16, Paris, France.

"Bristol's Recording Psychrometers." Under this title, The Bristol Co., Waterbury, Conn., has issued a 16-page illustrated pamphlet descriptive of the several types of psychrometers that it manufactures for determining the humidity in industrial plants. The use of these instruments makes it possible to ascertain at any time the relative humidity or atmospheric moisture. Many specimen scales and chart ranges are illustrated and a relative humidity table is included.

"Efficient Screening with the Jigger." The latest developments in vibrating screens are described and illustrated in the catalog bearing the above title, issued by the Productive Equipment Corp., 7535 S. Claremont Ave., Chicago, Ill. In the large and varied list of products handled successfully by the Jigger are many typical rubber compounding powders, and all of them without exception might have been included.

"Tire Tips" is a sixteen-page booklet on the care of pneumatic tires for passenger cars recently issued by the Rubber Manufacturers Association, 250 W. 57th St., New York, N. Y., in the interests of tire users, to promote observance of a few simple precautions necessary to obtain long wear from their tires. Photographs illustrate the more common tire failures resulting from misuse and the text explains the best way to avoid them. Individuals who may wish copies should ask their local tire dealers for them.

"Metric Packings" is a well-printed publication of 66 pages containing full illustrated descriptions of the "Metric" line of piston and other packings and pump valves manufactured by the Hewitt-Gutta Percha Rubber Corp., Buffalo, N. Y. Many varieties of standard and special packings are pictured accompanied by practical information on their adaptations and classifications. There are several pages of engineering data.

Disperso Carbon Black

One of the features necessary for ease and cleanliness of compounding carbon black is the elimination of the entrained air which causes fluffiness and consequent floating about of the black in handling and mixing. Utilization of a Wheatley press, under specially secured rights, has enabled the makers of Disperso brand of channel carbon black to eliminate the entrained air.

The amorphous black enters the hopper of the press and is forced by the screw downward through the conical-shaped container, being subjected simultaneously by the variable pitch of the screw to progressively increasing compression until it is conveyed to the first set of rollers. Here it is further compressed and passed through a second set of rollers, which break down the particle size to the absolute minimum.

All surplus occluded air and gases are eliminated by means of this severe progressive compression, leaving the carbon black in a state most advantageous for compounding into rubber. As a direct result of the better dispersion obtainable under these circumstances, the tensile strength of the rubber is greatly increased with the same reenforcement hardness. Elimination of the harmful gases contributes to better aging of the compounded stocks containing the compressed black.

Automobile Deaths Steadily Increase

That automobile deaths in the United States are steadily increasing, seems to be indicated by accident reports recently compiled by the National Safety Council. This report indicates an estimated total of 15,900 motor vehicle deaths for the first 7 months of 1929, as compared with 14,900 for 1928, or an increase of about 6 per cent.

EDITORIALS

Synthetic Rubber Marks Time

JUST as in many a historic crisis a leader seemed to be providentially provided at an appropriate time to restore order and balance, so it appears also that in a like juncture in economic conditions some potent agency always seems to come opportunely to relieve a strained situation. The familiar story of the timely establishment of the rubber planting industry scarcely two decades ago when wild rubber became dear and the supply inadequate is but one case in point. Now rubber is in ample supply, but the possibility of excessive rise in price still haunts many buyers. Will they again be caught napping as even in the recent past and be forced once more to pay so much for raw material that inventories would again have to be slashed and millions sacrificed in readjustment?

Assurance, however, is now given that such a situation is not likely to be duplicated. In other words, if natural rubber should again become dear, strong interests in the United States and abroad will be found ready to begin at once the manufacture on a large scale of a synthetic rubber at a moderate price and available for the major needs of the factories. The report that synthetic is just around the corner only waiting for the present price of natural rubber to about double to make its début as a real commodity may be scouted by many growers, but it is becoming increasingly evident that the production of synthetic rubber has latterly become more of an economic than a scientific problem, and indeed with both phases of the problem much nearer solution than is generally realized. In fact, it is authoritatively stated that one great American concern has in its "closet of the future" a thoroughly practical process fully developed, tagged, and put away for the future "psychological moment."

Ten years ago few even dreamed of the synthetic production of methanol and gasoline, but they are here at a cheap price. Up to twenty years ago such unique substances as the synthetic resins that have since invaded the fields of hard rubber and other materials were scarcely a hope. That a suitable synthetic rubber may soon afford us a similar experience is quite probable, even though it is unbelievable that, as one leading grower recently remarked, "The chemists are likely to synthetize us planters out of existence."

Natural rubber will always be in large demand at a fair price. But users are not likely to be again caught off guard, and with the measure of preparedness indicated, no general war interfering with shipping may again threaten to shut off or cut down normal supply of crude rubber.

Naturally will the query be propounded, What will be the source material of such synthetic? Alas, the answer must be deferred. It is known that the built-up rubber can be produced from coal, wood waste, and corn products; or perhaps the starting point may be the unsaturated hydrocarbons of the mineral-oil industry. It has been shown that isopropanol, an oil by-product, can be converted into isoprene, which unit, like its isomers, may be polymerized into a molecule substantially identical with that of caoutchouc. But, whatever the source, through improved reactions and with suitable catalysts a product may be yielded with plasticity, elasticity, elongation, and abrasive resistance comparable with the properties of high-grade natural rubber. Even the old stumbling block, that of vulcanization, has, it is said, been finally overcome with a very efficient agent.

The Goodrich-Hood Merger

THE taking over of the Hood Rubber Co. by The B. F. Goodrich Co. under mutually advantageous conditions is a merger helpful to the rubber industry. The Hood corporation, founded by George W. Hood, father of the recent head of the company, Frederic C. Hood, has long been one of the most conservatively operated of American rubber companies. Ever regarding quality of products as its guiding principle and keeping abreast of progress in production efficiency, it has also been foremost in employe welfare and other salutary activities of modern manufacturing concerns. Its fusion with the great Goodrich company means not only the acquisition by the latter of a valuable asset and an opportunity to strengthen its position and to effect many advisable economies, but also that another important and favorable step has been taken toward the goal for which all forward-looking rubber industrialists are ever striving—market stabilization.

Rubber Market Widens

MANY Far East rubber growers have long yearned for a wider market for their products, and especially for relief from too much dependence on one great outlet—the American rubber industry. Doubtless they will find some comfort then in the statement that during the past six years Canada has increased its buying by over 130, Germany over 100, Italy and Japan 46, and France 37½ per cent. Perhaps the ratio of such buying may even increase, but it is safe to predict that for many years to come America will still be purchasing far more crude rubber than all other buyers combined, and that Far East growers will not hesitate to supply the demand.

What the Rubber Chemists Are Doing

Stearic Acid Symposium

The following selections are from papers comprising the symposium on stearic acid, held by the New York Group of the Rubber Division, American Chemical Society, on March 20, 1929, and published in Industrial & Engineering Chemistry, August 1, 1929.

Stearic and Oleic Acids as Rubber-Compounding Ingredients

R. P. Dinsmore
The Goodyear Tire & Rubber Co., Akron, O.

IT IS proposed in this brief discussion to touch upon the relative effects of stearic and oleic acids in a few typical rubber stocks; then to discuss certain anomalies as to the effect of stearic acid on chemical and physical cure; and, lastly, to consider some of the differences found by use of different accelerators.

Inasmuch as oleic acid is the chief impurity in commercial stearic—running from 10 to 15 per cent—it seems desirable to know the behavior of oleic acid alone.

Comparison of Stearic and Oleic Acids

The following data show the comparative effects of double-pressed stearic and commercial oleic acids in typical rubber compounds.[1]

TABLE I—ACTION OF STEARIC AND OLEIC ACIDS IN TYPICAL RUBBER COMPOUNDS

Captax Tread—4 parts acid on 100 rubber
23 volumes black
1 volume ZnO
Best cure, 70 minutes at 127° C. (250° F.)

	Stearic	Oleic
Cure at 127° C., minutes	70–100	70–100
Modulus at 300 per cent, kg. per sq. cm.	68–90	61–75
Acid bloom after 15 hours*	None	Very bad

Captax Friction—0.6 part acid on 100 rubber
½ volume ZnO
8 parts softener
Best cure, 40 minutes at 127° C.

	Stearic	Oleic
Cure at 127° C., minutes	40–50	40–50
Modulus at 700 per cent, kg. per sq. cm.	85–97	78–85
Acid bloom*	None	No bloom, but very sticky

Zinc Oxide Friction—2 parts acid on 100 rubber
7½ volumes ZnO
4½ parts softener
Best cure, 30 minutes at 127° C.

	Stearic	Oleic
Cure at 127° C., minutes	30–40	30–40
Modulus at 300 per cent, kg. per sq. cm.	63–78	53–68
Acid bloom*	None	No bloom, but more tacky than control

* Uncured stock.

From these data it would appear that in captax stocks there is a distinct loss in modulus due to the substitution of stearic acid by oleic. This seems to be more pronounced in the loaded stocks. From the point of view of acid bloom, the tread stock was the only one giving trouble, but this is serious. It would thus appear that purified stearic acid might be desirable for carbon black stocks; whereas for friction stocks, where modulus is not always so important, less pure stearic could be used, particularly if additional tack is desired. It must be borne in mind that these conclusions are, so far, limited to captax.

Behavior of Stearic Acid

Let us now turn to stearic acid itself. We will note a few things about its behavior with zinc oxide and carbon black. It is necessary to distinguish between the effect on physical and chemical cure. This is shown by some unpublished work by C. R. Park, a summary of which is given in Tables II and III.

[1] This work was done by R. W. Beveridge of the compounding staff of The Goodyear Tire & Rubber Co.

Bracketed ingredients denote original materials in the rubber mix (except rubber). Material appended to bracket by plus sign is that which gives the effect on cure noted in the adjoining columns. Physical cure picked by hand. Vol. = volume loading on 100 volumes rubber; blk = micronex carbon black; acid = stearic acid; stiff. = modulus as shown by stress-strain curve.

TABLE II—EFFECT OF STEARIC ACID ON PHYSICAL AND CHEMICAL CURE

Composition	Combined Sulphur	Physical Cure	Stiff.
[25 vol. blk. + 8 pts. S] + 4 acid	Same	Same	Less
[25 vol. blk. + 8 pts. S] + 3¾ vol. ZnO	Inc. 70%	Inc. 15%	Inc. 70%
[25 vol. blk. + 8 pts. S + 3¾ vol. Zno] + 4 acid	Inc. 15%	Inc. 15%	Inc. 3%
[20 vol. blk. + 3 pts. S + 1 vol. ZnO + 1.2 captax] + 4 acid	Dec. 8%	Inc. 50%	Inc. 40%
[6 pts. S] + 1 vol. ZnO	Same	Inc. 16%	Inc. 40%
[3 pts. S + 1 vol. ZnO + 1.2 captax] + 4 acid	Curves cross	Dec. 20%*	Curves cross
[10 pts. S] + 1 vol. ZnO	....	10% faster	Inc. 50%
[10 pts. S] + 4 acid	....	20% slower	50% less
[10 pts. S + 1 vol. ZnO] + 4 acid	....	Same	30% Inc.
[3½ pts. S + 1 vol. ZnO] + 4 acid	....	Slight Inc.	Slight Dec.
[3½ pts. S + 1 vol. ZnO + 4 acid] + 0.5 captax	....	Cures 1/10 time	Great Inc.
[6 S] + 1 vol. ZnO	....	Inc. 10%	Inc. 100%
[6 S + 1 vol. ZnO] + 4 acid	....	Dec. 10%	Inc. 20%
[6 S + 1 vol. ZnO + 4 acid] + 0.25 captax	....	Inc. 90%	Inc. 600%

* See Figure 1.

TABLE III—COMPARISON OF STIFFENING EFFECT OF ZINC OXIDE AND BLACK

	($Kg./cm^2$) @ 700%
6 S + 1 vol. ZnO	52
6 S + 1 vol. Micronex	25
6 S + 1 vol. Thermatomic	26

Here we see that if stearic acid is added to a sulphur mix, there

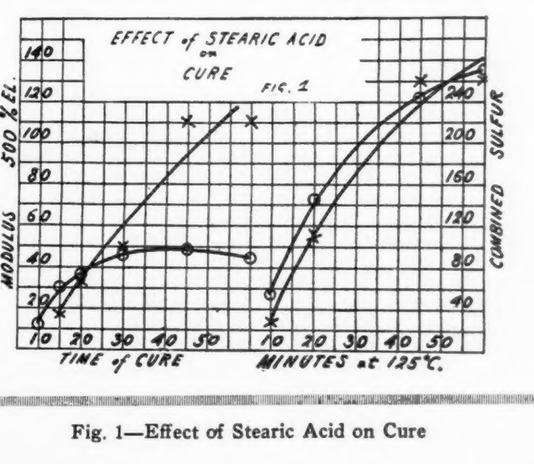


Fig. 1—Effect of Stearic Acid on Cure

is a marked decrease in chemical and physical cure. In a sulphur-black stock the cure is unchanged but the stiffness is decreased. Moreover, while the addition of one volume of zinc oxide to a sulphur or sulphur-black stock speeds up the cure and markedly increases the stiffness (double what one volume of black alone will do), the further addition of stearic speeds up chemical cure but has little further effect unless the sulphur content is high (10 per cent).

The addition of stearic to a sulphur-zinc-captax stock shows a large increase in the physical cure and stiffness for the black stocks and a softer stock at low cures for the non-black changing to stiffer as cure increases. The chemical cure is retarded in both cases.

Hence it would seem that stearic acid is, by itself, a retarder of chemical and physical cure. With zinc oxide it changes to an accelerator of chemical cure and with captax to an accelerator of physical cure. Here, however, even in the presence of zinc, the chemical cure is retarded.

[2] Dinsmore and Vogt, *Trans. Inst. Rubber Ind.*, 4, 85 (June, 1928); *Rubber Age*, 23, 554 (1928).

Action of Other Accelerators

The writer has previously published[2] a so-called accelerator classification which considered various typical groups of accelerators. The following remarks will apply to these groups only:

Work with extracted rubber shows: (1) All accelerators are improved by zinc oxide; (2) the zinc oxide must be rendered rubber-soluble by stearic acid except in the case of the dithiocarbamates and the thiurams which are capable of reacting directly with zinc oxide; (3) captax and derivatives must have zinc in soluble form to function at all; (4) P-nitroso will function in extracted rubber in the absence of zinc oxide but, if zinc oxide is present, it must have stearic also. Hence it would seem that the prime function of stearic acid is to furnish zinc oxide in a suitable form for the use of the accelerator. Otherwise it acts as a softener and retarder. As to why an excess of stearic acid retards diphenylguanidine and has no such action on other accelerators, it is hard to say. Perhaps there is a more or less stable diphenylguanidine stearate formed which is a non-accelerator. Certainly there is much to be explained as to the mechanism of the zinc soap in the physical cure of rubber.

Effect of Stearic Acid on Reclaimed Rubber

H. A. Winkelmann and E. B. Busenburg
Philadelphia Rubber Works Co., Akron, O.

IT IS the purpose of this paper to discuss the effect of stearic acid on the process of manufacture of reclaimed rubber and its effect when used with reclaimed rubber in vulcanized rubber goods. The uses of stearic acid in reclaimed rubber can best be grouped as follows: (1) in the digester or heater as a plasticizing agent to speed up the disaggregation of the rubber; (2) when added to the plasticized rubber on the mill or in an internal mixer, to facilitate addition of a pigment or to impart some desirable property or consistency; (3) in compounds containing substantial amounts of reclaimed rubber.

In most reclaiming processes softeners are used in the devulcanizer in conjunction with heat, to aid in plasticizing the rubber. They may also be added on a warm-up mill or in an internal mixer to give a reclaim with desirable properties for tubing machine and calender operations. It may be desirable to have a definite amount or a complete absence of tack. It is therefore essential that the right softener is used and that it is added at the proper time. Factory conditions such as type of equipment, method, and speed of processing and cooling conditions determine the limits of firmness, softness, tackiness, plasticity, milling properties, and nerve of the reclaimed rubber required by the rubber goods manufacturer.

Conclusions

1. Stearic acid does not compare with other softeners in plasticizing efficiency when used in contact with vulcanized rubber scrap during devulcanization.

2. Stearic acid when added as a softener to devulcanized scrap on the mill prior to refining imparts properties which are very desirable. (a) Makes the reclaim batch more plastic; (b) improves tubing and calendering properties; (c) reduces nerve without production of excess tack; (d) improves curing properties (higher tensile strength, higher modulus, and improved molding properties) of reclaimed rubber; (e) when pigments are added, it gives better dispersion with improved physical properties.

3. Stearic acid when used in compounds containing reclaimed rubber improves the curing properties of these compounds.

Stearic Acid in Litharge-Cured Rubber Compounds

J. R. Sheppard
The Eagle-Picher Lead Co., Joplin, Mo.

IT IS now well understood that resins promote vulcanization through their content of organic acid. It was proposed by Bedford and Winkelmann[1] in 1924 that litharge vulcanization proceeds by the following steps: (a) reaction of lead oxide with an organic acid (naturally present in the resin or added during the mixing) to form a rubber-soluble soap; (b) reaction of the lead soap with hydrogen sulphide to form a hydrosulphide salt or a hydrosulphide; (c) reaction of the latter with sulphur to form a disulphide and then a polysulphide; (d) decomposition of the (unstable) polysulphide to yield a very active form of sulphur—the ultimate vulcanizer. The polysulphide theory has been generally accepted as accounting adequately for the known facts.

It is clear, then, that the efficiency of litharge as an accelerator is absolutely dependent upon the existence of an organic acid in the rubber as mixed. The mere statement of this general principle, however, by no means gives the compounder all the information he desires in the matter of organic acids as related to litharge curing. Various questions of practical importance arise. In the present paper an attempt will be made not comprehensively or systematically to survey all these numerous questions, but only to illustrate a number of scattered but specific cases. It is advisable not to generalize too broadly, but to confine the conclusions to the particular conditions applying to each case.

[1] Bedford and Winkelmann, *Ind. Eng. Chem.*, 16, 32 (1924).

Summary

Although an organic acid is essential to vulcanization with litharge, smoked sheet usually has enough natural acid for full activation. Ror example, when 5 per cent stearic acid (or similar softeners) was added to a standard smoked sheet in a high zinc oxide stock, the properties were lowered. On the other hand, a "low-grade" rubber, Lopori, was greatly improved in a high zinc oxide formula by stearic and by other acids.

Acidic softeners in a high zinc oxide stock increased set, even when they promoted vulcanization.

In a pure gum litharge formula with smoked sheet, 1 per cent stearic had but little effect, while in a high gas black formula, 4 per cent stearic raised the tensile (probably due to improved dispersion) but had no marked effect on rate of cure.

When litharge was used as the activator for mercaptobenzothiazole, stearic acid had but little effect either in pure gum or high gas black stocks. On the contrary, when zinc oxide was used, proper curing was highly dependent on stearic, especially with gas black. The litharge-mercaptobenzothiazole compounds with gas black in tread stock proportions, either with or without stearic, yielded a high tensile over a wide range of cures.

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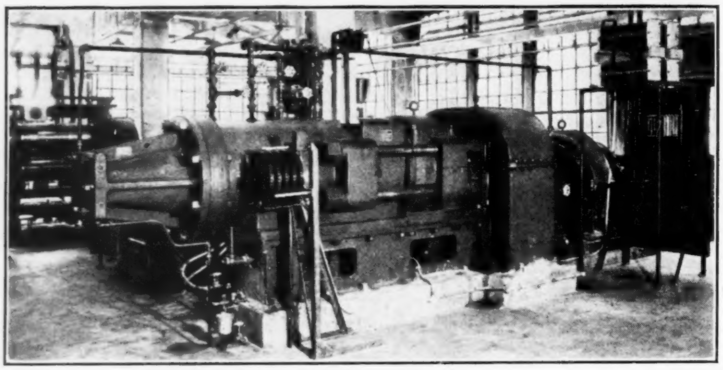
Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Aetna	Com.	$0.25 q.	Oct. 1	Sept. 16
Aetna	Pfd.	$1.75 q.	Oct. 1	Sept. 16
American Hard Rubber	Pfd.	2% q.	Oct. 1	Sept. 15
Baldwin	Cl. A. Pfd.	$0.37½ q.	Sept. 30	Sept. 20
Dominion	Pfd.	$1.75 q.	Sept. 30	Sept. 23
General	6% Cum. Pfd.	$1.50 q.	Sept. 30	Sept. 20
Goodyear (Calif.)	Com.	$1.75 q.	Oct. 1	Sept. 20
Goodyear (Canada)	Com.	$1.25 q.	Oct. 1	Sept. 14
Goodyear (Canada)	Com.	$5.00 ex.	Oct. 1	Sept. 14
Goodyear (Canada)	Pfd.	$1.75 q.	Oct. 1	Sept. 14
Mohawk	Pfd.	$1.75 q.	Oct. 1	Sept. 15
Seiberling	Pfd.	$2.00 q.	Oct. 1	Sept. 20

New Machines and Appliances



Adamson Solid Tire Tuber

Mammoth Tubing Machine

THE production of solid tires of the larger sizes as equipment for heavy, slow-speed automobile trucks calls for tubers or extruding machines of extraordinary weight and power beyond anything heretofore made for that purpose. The largest machine ever built for this service is the 16-inch tuber pictured in the illustration, now installed in one of the great rubber plants of Akron, O.

This exceptional machine is one of the last achievements of the late Alexander Adamson, founder of the Adamson Machine Co. Its over-all dimensions are: length, 21 feet, exclusive of the die head; width, 5 feet 4 inches; and height, 5 feet 3 inches. It has the capacity for handling 23,000 pounds of rubber per hour at 20 r.p.m.

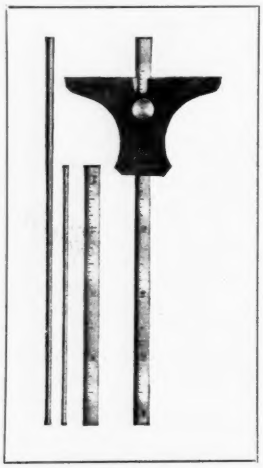
A few other features of this giant tuber are as follows: It is equipped with roll-away, self-alining, thrust roller bearings. The screw is water-cooled and specially designed for automatic feeding. The gears are enclosed in an oil-tight case with force feed lubrication to all bearings by means of a pump. The machine is operated by a 250 h.p. d.c. motor giving a possible range of speed of 15 to 30 r.p.m. The cylinder is bushed and water-jacketed to facilitate cooling the stock.

The machine pictured is the first of its size and model to be built and installed. A second, of similar type, is projected, to be used by another Akron rubber company for massing rubber. The Adamson Machine Co., Akron, O.

Rule Depth Gage

THE illustration represents a most convenient combination tool for machinists, mold makers, and others who have need in their work to measure the depth of holes with accuracy.

This tool is designed so that in addition to using either a 4- or 6-inch rule



B. & S. Depth Gage

it has the added feature of a rod for conveniently measuring depth in small holes, where the rules cannot be used. This rod is 5/64-inch in diameter. The 4- and 6-inch rules are graduated to 32nds and 64ths of an inch, English measure, or in millimeters and half-millimeters, metric measure.

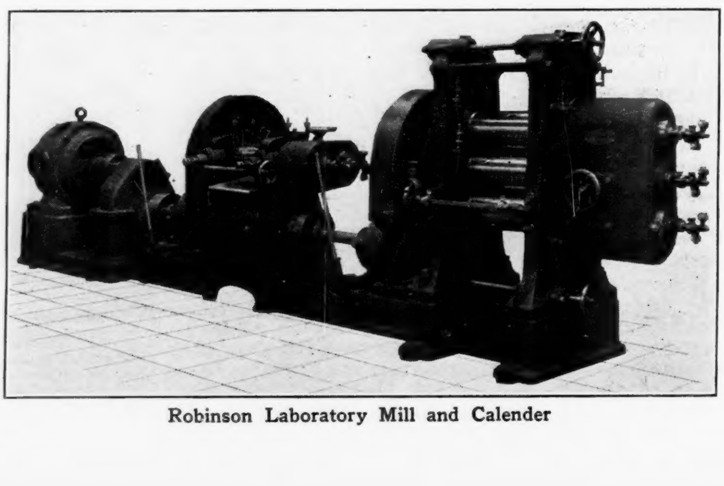
The rod on the rule is conveniently locked at any reading by a turn of the knurled nut on the base. The base is 2½ inches wide. The workmanship and the accuracy of the scale graduations are of the well-known excellence of the makers of the tool. Brown & Sharpe Mfg. Co., Providence, R. I.

Rubber Laboratory Mixing Equipment

AN excellent example of modern British mixing equipment for the factory compounding laboratory is here pictured. The set comprises a motor-driven calender and a mixer mounted as a unit on a box base-plate or foundation. Connection between the motor and the mill and calender is made by a fully enclosed high-efficiency reduction gear. The power of the motor is 30 British h.p. All gears are covered by close-fitting cast-iron guards securely bolted to place against disarrangement.

The mixer is of improved type arranged for even speed and friction ratio of 2 to 1 between the rolls, either roll being put into gear by means of an enclosed gear box at the right-hand side of the machine. The mixing rolls are of deep chilled cast iron 8 inches diameter by 16 inches wide face. The front roll setting gear is of the combined and independent type.

The calender rolls are 9 inches diameter by 18 inches face and like the mill rolls are deep chilled cast iron. The roll end gears are arranged for even speed between center and bottom roll. Gear guards enclose all gears and also house the change-over gear for friction or even



Robinson Laboratory Mill and Calender

speed. Speed ratio change is effected by operation of a handwheel on the front of the gear box at the right of the calender. The top and bottom roll setting gears consist of vertical square thread screws actuated by worm gear and cross-shafts with handwheels at top and bottom respectively of the calender frame.

Mill and calender are both driven from a continuous line shaft. Each machine is provided with a friction clutch for starting and stopping. Joseph Robinson & Co., Ltd., Greengate, Salford, Manchester, England.

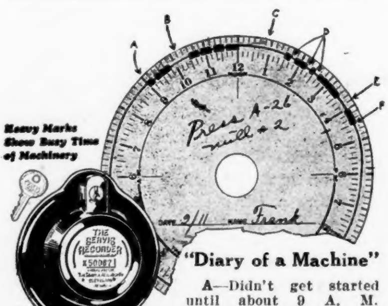
Time Clock for Machinery

THE actual busy time of any machine gages its productive or profit-making value in the factory scheme. Operatives ring in and out of the factory and are frequently held to a production schedule checked by mechanical devices. Clocking machinery is even more important as it automatically clocks the machine operator on the job which is more to the point than clocking his entrance to and exit from the plant.

The device illustrated is universally applicable to any machinery to record its busy and active periods. Within the locked case of the instrument is a pendulum used merely to supply motion to a stylus which it carries in its upper end. Any motion which will shake or move the pendulum in any way also serves to move the stylus and make a record.

In service the recorder is closed so that the stylus is brought up against a chart. The latter is constantly turned at clock speed by a timing mechanism, but the stylus marks the chart only during the time when the pendulum is put in motion by the working activity of the machinery to which the recorder is attached. For its attachment it is only necessary to bolt the instrument to some part where it will receive a pronounced and deliberate motion. There are no allowances or calculations to make and the recorder can be easily transferred from one machine to another.

In a rubber factory presses would probably be selected for clocking, but there are many other places for time study of machinery which will occur to every superintendent or production manager solving problems of production and cost. The Service Recorder Co., 454 Hanna Building, Cleveland, O.



"Diary of a Machine"

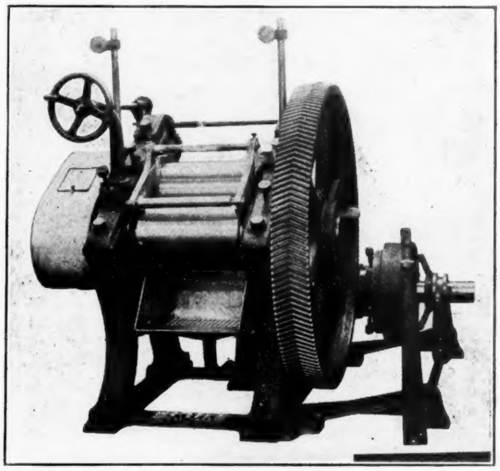
A—Didn't get started until about 9 A. M. B—Stop of 40 minutes—waiting for material. C—A hearty lunch! D—Three 10-minute stops—machine jammed by poor material. E—Operative left machine for half an hour. Why? F—Plenty of time to wash up! Quitting time not until 5:00.

"Servis" Recorder

Plantation Rubber Washer

MILLS used for washing freshly coagulated plantation rubber are naturally of different design, size, and power than those used for washing the various grades of crude rubber met with in a rubber goods manufactory. The rolls are shorter and of less diameter, the front roll being driven by a large herringbone gear.

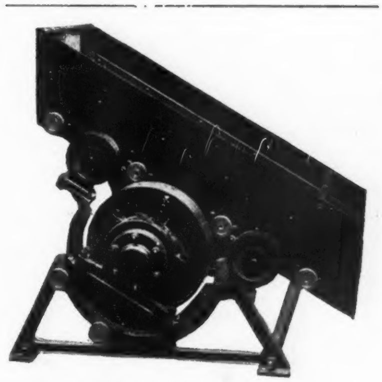
Other details are shown in the illustration of the "Dirobe" type washer. This machine has smooth surface, hard, close grained or chilled cast-iron rolls, 12 inches diameter by 18 inches face, set at an angle of 30° to the horizontal. The machine is arranged to be driven from a line shaft by machine-cut herringbone gearing. The pinion bolts to the boss of the external part of the friction clutch, which enables the machine to be started and stopped gradually without shock or jar. The back roll is the adjustable one, the adjustment gear being operated by a hand-wheel from the front of the machine.



David Bridge Plantation Rubber Washer "Dirobe" Individual Machine

When these machines are operated from the same line shafting, the clutch is coupled to the prime mover. In conjunction with it is arranged a safety release gear. In the event of an operator being caught in the rolls, it is only necessary for the wire rope passing over the line of machines to be touched and the main clutch is put out of gear, stopping all machines. D. Bridge & Co., Ltd., Castleton, Manchester, Eng.

WHILE PULLING A ROLL OF FABRIC AT THE let-off end of the calender, a helper caught his left middle finger between the bar and the bar socket. The injury to his finger necessitated it being amputated at the end joint. One hundred and fifty days were charged to this accident.—Rubber Section, N. S. C.



The Jigger Vibrating Screen

Compound Room Sifter

THE advantages of using screened powders for rubber compounding is recognized in every rubber plant. Not only does sifting eliminate stray impurities of many sorts but it puts the stock into better condition for mixing by eliminating lumps and thoroughly commingling the dry ingredients.

An interesting sifter that is particularly well suited for these purposes is that shown in the illustration. It is a vibrating screen with a positive eccentric action produced by means of a screen frame mounted on an eccentric shaft. As this shaft revolves, whether very fast or very slow, the screen cloth receives motion similar to the travel of a point on the shaft. However, complete turning of the screen deck is prevented by balance supports located at each end of the screen side-sheets. This construction produces a uniform circular motion to all parts of the screen cloth, which accounts for the remarkable grading secured by the machine.

The sifter is built open and enclosed with one or two decks. The form preferred for sifting rubber compounding powders is the one-deck pattern as pictured with dust housing.

The screen body is mounted upon rubber disks which are in turn secured to a tiltable framework. The framework pivots about a shaft which runs beneath the frame and carries the eccentrics and two heavy fly-wheels. The fly-wheels confine the vibration to the screen itself, while the eccentrics cause the vibration. The eccentricity of the latter is variable at will, depending upon the type of service required. This is accomplished by rotating the eccentric upon the drive shaft, which is itself eccentric.

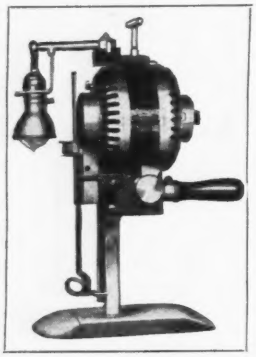
The adjustment of the incline can be made without tools. Degree angles marked upon the adjusting quadrant permit recording of the most suitable angle for every case. Another feature of the screen is the ease with which the cloth may be changed without use of tools by simply operating the hand-nuts, which serve to clamp the screen cloth between angle irons and regulate its tension. Productive Equipment Corp., 7535 S. Claremont Ave., Chicago, Ill.

Electric Cloth-Cutter

An electric cloth-cutting machine of the latest design is here illustrated. It is classed as an unexcelled high-speed, high-power, straight-knife cutter. It has a powerful and efficient motor, which will drive the knife through the heaviest materials, such as leather, rubberized fabrics, and similar stock, which heretofore have been too difficult for ordinary cutting machines.

This machine is equipped with a patent oil-drip device, which automatically places a thin film of oil on the cutting edge, thereby keeping it cool, sharp, and lubricated. The latter feature is particularly essential in cutting heavy lays of rubberized goods, canvas, and other tough materials, which tend to bind the knife.

The model pictured is also equipped with self-alining oversize bearings; a quick acting and quick detachable presser-foot, which permits sharpening the knife without resetting the presser-foot; a new improved switch; perfected oiling system; and several other refinements which add to the speed, efficiency, ease of operation, and the all-around satisfactory service which the machine will give. The motor is 110 or 220-volt single or 3-phase for alternating current.



Eastman Model XB Cloth Cutter

This electric cutter operated in conjunction with the same company's cloth-laying machine makes an ideal equipment for the economical production of accurately cut parts of shoes, fitted wearing apparel, or other sized goods. Eastman Machine Co., Buffalo, N. Y.

Self-Feeding Wire-Straighteners

These machines were originally designed for use in the manufacture of insulated wire, and in this connection are used for straightening and feeding the wire into the covering machine. They are of two types, the rotary and the roller feed, as here pictured. Either or both will be found very useful in mechanical rubber goods plants where the rods used as hose poles always become bent out of their proper straight condition. In that state they are not fit for making hose upon either by hand or machine.

The greatest offenders in this particular are the small cold-rolled steel rods used for cloth insertion (c. i.) tubing. These are so readily bent in the ordinary course of work that they should properly be passed through a rotary type of straightener every time they are used. So handled, the tubing made upon them is better rolled and strips from the rods with less expenditure of time and hand-labor.

The self-feeding rotary straightener, illustrated in Figure 1, consists of a five-die rotary straightener, with single pulley and a pair of feed rolls for drawing the wire through the straightener and feeding it into another machine or out on a bench as may be required. The rotary straightener and feeding rolls are run by independent belts from a countershaft. They are made in sizes from 1/16-inch to ¾-inch, the size indicating the largest diameter the machine is designed to handle, and each will also handle several sizes smaller than its maximum.

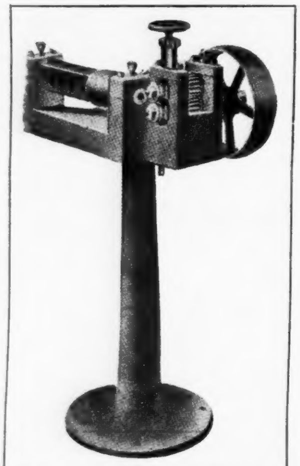


Fig 1.—Self-Feeding Rotary

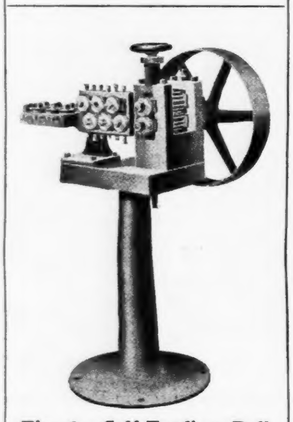


Fig. 2.—Self-Feeding Roll

Shuster Wire-Straighteners

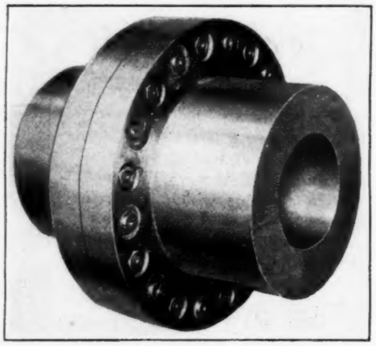
For straightening larger-sized steel poles, the roll straightener is the more suitable; in fact, it is the only form to be used.

The self-feeding roll straightener, shown in Figure 2, consists of a twelve-roll straightener and a pair of feeding rolls, and can be used in the same manner as the rotary straightener described above, although on some classes of work the roll type is preferable. It is made in sizes from ⅛-inch to ½-inch, the size indicating the largest diameter of wire the machine is designed to handle.

In wire straightening oil is used as a lubricant. It can best be applied by running the wire through clean oily cloth just before it enters the straightener. A few drops at a time only of the oil are applied to the rag. This gives a better finish to the wire and greatly lessens the wear on the dies and rolls. The F. B. Shuster Co., New Haven, Conn.

Large Flexible Coupling

Flexible couplings of many designs are familiar in rubber plants and other factories. The illustration pictures the pin, bushing, and rubber bumper type of coupling, which was recently installed by the International Paper Co., Corinth, N. Y., for connection between a water-wheel and a speed increaser. It will be used to transmit 1,200 h. p. at 220 r. p, m., and its weight is one ton.



1,200 H.P. Flexible Coupling

This installation is unusual in that the coupling is the largest of its kind ever built. Engineers of the above company decided to purchase this coupling due principally to its simplicity, resistance to severe operating conditions, and the fact that it requires absolutely no maintenance.

In the past many engineers have erroneously maintained that a coupling of this type (pin, bushing, and rubber bumper) would not stand up in the larger sizes. This theory has been definitely disproved and couplings have been built in large sizes for heavy duties up to 12-inch bore. Ajax Flexible Coupling Co., Westfield, N. Y.

Hytempite Refractory Cement

Hytempite is a ready-to-use dense plastic refractory cement scientifically compounded. It is used to form a lasting union between fire bricks in furnace construction. It has a high fusion point and the coefficient of expansion and contraction is equivalent to that of the refractory material which it bonds.

Joints made with this cement are impervious to most of the conditions encountered in furnace practice, such as abrasion, corrosion, chemical action, and extreme sudden variations of temperature, all of which bring about furnace lining failures. Quigley Furnace Specialties Co., 26 Cortlandt St., New York, N. Y.

Rubber Factory Topics

Early Process of Rubberizing Fabrics

THE method of rubberizing fabrics for raincoat manufacture as practiced fifty years or more ago was exceedingly slow and crude as compared with that in use today. The rubberizing was done on a simple spreading device known as the "Yankee Flier," a name which impressed the idea of smartness and speed in the centennial year 1876. This machine consisted of two revoluble drums set about ninety feet apart and connected by the fabric to be coated, the ends of which were cemented together to form an endless belt driven by the drum at the head of the machine. At this drum was located the usual adjustable knife spreading mechanism back of which the soft rubber cement stock was placed.

The endless belt formed by the goods was allowed to travel under the spreading knife continuously until the desired weight of rubber mixing was applied. At this point the fabric was severed at the cemented joint and the coated piece removed for the next operation, which was vulcanizing by "solarizing" or exposing it to full sunshine for a period of three hours.

Rubberized raincoat fabrics were formerly black only, finished with a shellacked bright surface. No change in the method of finishing was introduced until 1883 at which time the silvery finish known also as "Electric" finish was introduced by the Chicago Rubber Clothing Co. This finish was obtained by dusting the spread coating of rubber with potato starch before solarizing or vulcanizing.

Cornstarch as a dusting finish for rubber surfaced raincoats was introduced in 1883. It gives a soft silky finish but is less lustrous than that obtainable with potato starch.

First Aid for Chemical Burns

NO course in first aid is complete these days without some knowledge of the emergency treatment of chemical burns. Such burns may be classified according to acid or alkali source, the former including burns from nitric, sulphuric, muriatic, acetic, oxalic, hydrofluoric, picric, carbolic, and chromic acids. The latter are represented by caustic soda and potash, lime, ammonia, and soda ash.

It is always desirable to determine first whether a burn is acid or alkaline. Litmus paper wet in water should be used. In either case, then, the burn should be well flushed with water after which it is to be neutralized, in case of acid, with a 10 per cent soda solution, and in case of alkali, with weak vinegar (or dilute acetic acid). The bathing of the spot with the neutralizing solution should continue for some minutes. The dressing to be used after neutralization is identical with that for ordinary burns. In certain cases, special treatment is recommended. Chromium burns require immediate treatment with sodium hyposulphite solution. Phenol burns should be washed freely with clean water after which alcohol is applied. Prussic acid burns should be bathed freely in hydrogen peroxide after flushing with water. *Scientific American.*

A USEFUL TABLE

IN main and departmental factory offices one of the requisite reference charts is that printed below, which gives the decimal equivalents of parts of an inch. One finds this table printed in legible type posted on factory and office walls wherever specification goods are made whether for mechanical purposes or otherwise, and in laboratories, cost departments, drafting rooms, etc.

While the table printed herewith is not sufficiently large for distant reading, it will answer very well for desk reference.

DECIMAL EQUIVALENTS OF PARTS OF ONE INCH

1/64	.015625	17/64	.265625	33/64	.515625	49/64	.765625
1/32	.03125	9/32	.28125	17/32	.53125	25/32	.78125
3/64	.046875	19/64	.296875	35/64	.546875	51/64	.796875
1/16	.0625	5/16	.3125	9/16	.5625	13/16	.8125
5/64	.078125	21/64	.328125	37/64	.578125	53/64	.828125
3/32	.09375	11/32	.34375	19/32	.59375	27/32	.84375
7/64	.109375	23/64	.359375	39/64	.609375	55/64	.859375
1/8	.125	3/8	.375	5/8	.625	7/8	.875
9/64	.140625	25/64	.390625	41/64	.640625	57/64	.890625
5/32	.15625	13/32	.40625	21/32	.65625	29/32	.90625
11/64	.171875	27/64	.421875	43/64	.671875	59/64	.921875
3/16	.1875	7/16	.4375	11/16	.6875	15/16	.9375
13/64	.203125	29/64	.453125	45/64	.703125	61/64	.953125
7/32	.21875	15/32	.46875	23/32	.71875	31/32	.96875
15/64	.234375	31/64	.484375	47/64	.734375	63/64	.984375
1/4	.25	1/2	.5	3/4	.75	1	1.

Roller Bearings

A LEADING American manufacturer of mills, mixers, calenders, and other rubber working machinery makes the following remarks on the adaptation of roller bearings to heavy rubber machinery.

We have followed the development of roller bearings closely, are keenly alive to their advantages under proper conditions, and have made use of them where their application seemed to be beneficial. Where operating speeds are fairly high and bearing pressure relatively low, this type of bearing has certain advantageous features and does effect savings in power in addition to other economies. We have used roller bearings extensively on rolling mills for non-ferrous metals and in the rubber field have applied them to plasticators, tubing machines, and drives. The benefits for these purposes are unquestioned.

When it comes to the roll journals of mills and calenders, however, it has not yet been demonstrated that they fulfill the claims made for them. On mills the speeds are comparatively slow, and very heavy bearing pressures are encountered. Tests which have been made indicate a very small power saving, too small to warrant the high additional cost of installing these bearings.

We should be very much interested to see roller bearings tried out on refiner roll journals, as the operating conditions on these machines would seem to be more favorable to their use. Speeds are higher and bearing pressures fairly constant so that there is a better oppor-

tunity for them to show savings that would more than offset the cost of installation.

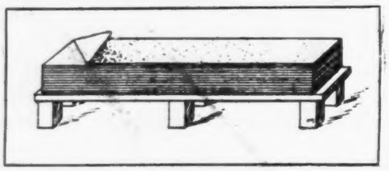
No tests have ever been made that we know of on calenders, and it is not known whether the savings would make their installation worth while. One obstacle in the way of their use on these machines is that the conventional design is not very well adapted for their application, and it would probably be necessary to redesign the housings to accommodate them. This in itself would be extremely expensive and they would have to produce considerable power savings or other operating economies to justify the expense.

It is claimed that it is a simple matter to mount Timken bearings to take care of the variation in temperature. It is true that these bearings have an adjustment to compensate for different temperatures. While it may be simple in theory, it is really very difficult of attainment. The adjustment must be very carefully made after the rolls are brought to the correct temperature, and because of the gears and guards which cover up the bearings it is very difficult to get at the place on the bearings where the adjustment is located. In fact, it is necessary to remove these parts to gain access to the adjustment so that this is also a considerable handicap.

We are very much interested in the development of anti-friction bearings and are using them where their application seems profitable. We are keeping close watch of the situation in regard to mills and calenders and similar machines, and if and when they are developed to the point where it seems advantageous to use them for roll journals on these machines, we hope to be the first to apply them, as we are always anxious to further new developments which promise to benefit the rubber industry. However, since any profit derived from the use of anti-friction bearings accrues directly to the user of the machine and the manufacturer of the bearings, the expense of conducting experiments and tests to further their development might well be borne by those who will receive the benefits rather than by the machinery manufacturer.

Dental-Gum Stock Table

An important accessory in the manufacture of dental rubber is a stock storage bench for sheet calendered on glazed holland. Such rubber is run, cut, and



Dental Stock Table

trimmed into pieces measuring 8 feet long by 18 inches wide. These are stored as cut, each sheet being spread smooth and even as it is laid in place on a heavy bench standing one foot high, shown in the accompanying illustration.

From this stock table the holland-backed sheets are transferred singly to a special cutting-table 30 inches high with top 10 feet long by 40 inches wide. There they are hand cut to small, standard-size, rectangular pieces ready for boxing for dentists' use.

Blubber-Rubber Making

An almost-forgotten industry that thrived half a century ago was that of making blubber-rubbers, as such playthings were called. The blubbers were really squares of smoked wild rubber film, about 1¾ inches each way, separated by hand from biscuits of Bolivian fine Pará. They were actually one of the innumerable coatings of latex that had accumulated on a dipped paddle and had been laboriously coagulated by a native of the Amazonian wilds by continuously turning the paddle over a smoky fire. Children used to place the thin membranes over their mouths and by sucking them inside would produce in their mouths hollow spheres that could be tied at the lips with a thread.

The pioneer in this line was the G. I. R. Glove Manufacturing Co., then operating in Naugatuck, Conn. Cyrus N. Squires was foreman of the clothing department, B. M. Hotchkiss was superintendent, and Geo. M. Allerton was president. The crude rubber biscuits were first cut into cubes of the desired size and then immersed for hours in water. When they were well softened, the blocks were laboriously plucked apart, and, after having been washed in pure water, the layers of rubber were tied up in packages of twenty and expressed to New York City for nation-wide distribution.

Blubber-rubbers had an extensive vogue for years, but so many complaints were made about children being injured by the spheres bursting in their mouths that finally laws were passed prohibiting the blubbers as dangerous manufactures. Soon they passed into the limbo of forgotten novelties, and with them went the curious method of inflating rubber balls by the oral vacuum process.

Vapor Cure Cabinet

The veteran rubber man, Arthur C. Squires, is credited with originating a number of practical manufacturing processes, apparatus, and rubber working tools and equipment. One from many such processes is described below.

This is the vapor curing compartment as originally built for vulcanizing thin pure gum articles such as dress shields, dental dam, bathing caps, etc. The curing chamber is a glass enclosure mounted on posts at a height convenient for loading the objects to be cured, which are suspended by suitable supports in the space above a series of return bend steam pipes located near the bottom of the curing chamber.

Steam at low pressure is circulated through the return bends to facilitate the reaction of the sulphur chloride, the vapors of which fill the curing chamber. The supply of sulphur chloride, otherwise known as "curing acid," is contained in a shallow vessel set within the chamber upon the steam pipes.

Access to the interior of the chamber is gained by raising the hinged glazed sashes that form its top. Following the cure, the vessel containing the sulphur chloride is removed and one containing ammonia water is substituted so that the excess acid which adheres to the goods may be fully neutralized and thus prevent damage of the goods by after-vulcanization.

This apparatus was originated in 1888 and applied as manufacturing equipment in 1902 at the Akron plant of The B. F. Goodrich Co., where it was used for curing dipped articles and a variety of thin calendered goods.

Electric Cement Drier

Cementing for construction and repair work on rubber goods is generally wasteful of time by reason of the delay necessary to insure complete evaporation of the solvent. To obviate this delay, an ordinary electric hair drier such as is used in the modern barber shop or beauty parlor may be employed, and is so used in certain leading rubber factories in the United States.

Rubber Cement Drier

This instrument is obtainable on various types of mounting. The most generally useful for rubber work is the plain standard type for table use, because the blower can be set as close to the work as desired. The drier itself is a small centrifugal fan blower with a heat-control switch for giving hot or cold air. The outlet can be used short or with the extension piece, and delivery of the air upon the work can be made at any angle by adjustment of the blower on its stand.

Factory Telephone Signal

Interdepartmental telephoning is very greatly facilitated, particularly in large and noisy factory rooms, by the installation of a device which lights a colored electric lamp when the telephone rings. One has only to observe this light signal in use to appreciate its practical value.

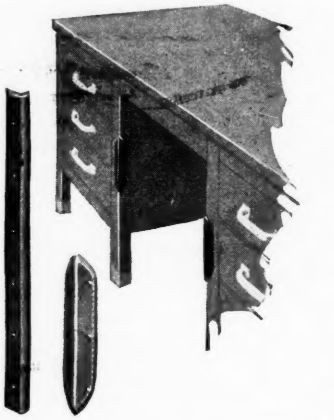
These devices may be had by any telephone subscriber on application to the local business office of his telephone company.

New Goods and Specialties

Rubber Desk Guards

"PROTECT the clothes, save the hose"—thousands of office workers will acclaim that most fitting slogan. For "Sunruco" rubber desk guards, shown in the illustration, will actually perform that service. Desk-leg corners by the continual bumping of the chair are soon badly scarred, chipped, and splintered, causing them to damage clothing and to snag hose, which, of course, is most aggravating, distracting, and expensive for the employe. "Sunruco" desk guards, when applied to old furniture, vanish the hazards and unsightliness just mentioned.

"Sunruco" desk guards are made of a firm tough composition, fully guaranteed for the life of the desk. They are easy to

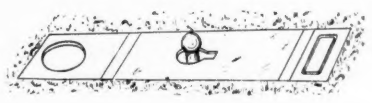


New "Sunruco" Specialty

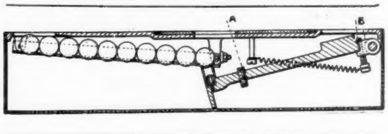
apply and are packed one pair to a box, with necessary brads for fastening. They come in a brown color which looks well on all woods. These desk guards are available in two sizes: No. 1, 6-inch length, and No. 2, 20-inch length. The latter may be applied also to the backs and arms of chairs for protective purposes. The Sun Rubber Co., Barberton, O.

British Use Rubber in Golf Practice Device

THE Ever Ready tee is an ingenious device which enables golf to be practiced, indoors or outdoors, without the need of placing the ball by hand on a tee, or in fact handling the ball at all. It is in the shape of an oblong box, which is sunk flush with the ground level. The magazine of the device holds ten balls, which are fed through the round hole at one extremity. On depressing the rectangular platform at the other extremity with the head of a club and then allowing it to re-



Golf Tee and Putting Device



Sectional View

turn to its normal position, a ball is automatically placed on the tee ready for driving.

It will be seen that all the balls may be teed up in succession and driven off without the player having to bend down to make tees or to put the ball on a ready-made tee. The balls may be driven into a net placed at a convenient distance from the tee and after all the balls in the magazine have been driven off, a putter may be employed for putting them back into the round hole, whereupon the device is once more ready for further driving practice. The special tubular tee is designed to stand prolonged use. Inasmuch as it is made of the most flexible rubber tubing, it does not suffer injury from the most violent stroke, nor does it harm the club. It is held in position by a single screw, which makes replacement the work of a few moments.

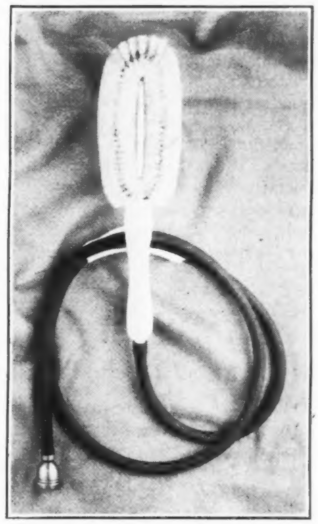
In the sectional view, shown here, the screw *A* enables the tee to be adjusted to any convenient height; while the screw *B* serves to adjust the strength of the return spring, which should be slightly more than sufficient to support the tee and a ball. The Ever Ready Golf Tee Co., 329 High Holborn, W. C. 1., England.

Fuller Friction Shower Brush and Tube

THE shower brush, here illustrated, consists of an oval-shaped, twisted-in-wire brush mounted on a Fuller handle having a perforated tube projecting along the center line of the oval brush. At the opposite end of the handle is a bib on which a length of rubber hose fits, and on the extremity of the hose is a rubber diaphragm adapter which is designed to attach to the largest variety of faucets. Other adapters are available so that the device can be attached to practically any water outlet.

The brush is made of material specially selected to present the right amount of frictional invigoration to the skin and at the same time to stand up under hot and cold water, soaps, etc. This material is double-twisted into a carefully developed grade of wire having the necessary resiliency to withstand the operating conditions of the article and at the same time to allow for the twisting strains. This wire is adequately protected against the action of water and washing compounds.

The handle is formed up in a graceful design from sheet Fullerex. Through its center runs a Fullerex tube projecting into the brush and provided with orifices so arranged as to project the jets of water into the brush; thus while providing adequate water for an invigorating shower, the streams are prevented from objectionally spraying in an uncontrollable manner. The handle is reenforced with a suitable filler, which also is arranged to give a perfect balance to the device.

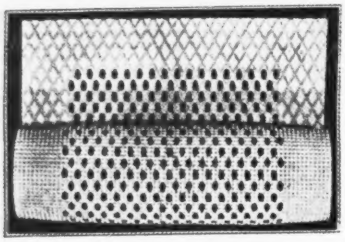


Improved Bathroom Accessory

The brush wires are inserted through two holes in the handle and are securely cemented with a material which will withstand the various abuses to which the article is subjected. The Fuller Brush Co., Hartford, Conn.

Dundee "A" Friction Tape

THE Okonite Co., Passaic, N. J., manufactures a rubber-filled cloth tape, known as Dundee "A," for the mechanical protection of insulated joints. It is not a tape that "feels sticky." Its maker recommends the tape for its high quality, long life, economy, and reliability under all conditions of service. The Okonite Co. will send a sample roll which may be tested for adhesive strength, uniformity, toughness, and durability of fabric, and even exposure to the elements. The tape comes in only one color—black. Rolls of any desired width and weight can be made.



English Pyramid-Back Mat

Non-Slip Rubber Bowling Green Mat

A NEW footer mat for bowling greens is now made by William Warne & Co., Ltd., 29 Gresham St., London, E. C. 2, England, which will be approved by all bowlers who have experienced the disadvantages of rubber mats slipping on wet turf. This has in the past been overcome in some cases by using the mat upside down, but then, of course, the bowler was liable to slip on the smooth undersurface of the mat.

The new mat, which combines all the features and advantages of the various moldings, is punched with moldings on both surfaces. The upper face is molded with diamond indentations and the center panel is punched through, leaving the border surrounding solid. This punching gives an extra grip on the turf and the holes allow any moisture to escape. The whole of the back of the mat is embossed with pyramids which will grip on any turf.

These mats are made in two sizes, 18 by 12 inches, and 22 by 14 inches, both in ordinary grey quality and also in "super white" quality.

All-Elastic Swimming and Athletic Brassiere

WOMEN who are active in athletics will welcome this new brassiere. It was designed especially for swimming, tennis, basketball, golf, and gym work, but may also be used for dress wear. This Gold Bond brassiere is cool and comfortable, and offers perfect support. Although it is form-fitting, it will not bind. Moreover, it is porous and washable.

The garment is made in three sizes: small, medium, and large. It comes also in three models: Number 40, plain elastic front; Number 50, mesh elastic front; Number 60, made of very fine dainty materials. Numbers 40 and 50 are recommended for sports only; while Number 60 is highly endorsed for dress as well as sports.

Gold Bond Brassiere

The brassiere is manufactured exclusively by the Dixie Elastic Goods Mfg. Co., Middlesboro, Ky. That organization is applying for a patent on the article because it believes that nothing like this item has ever before been placed on the market.

The Call of the Wild

EVERY hunter needs a caller to lure the game to him. In consequence, Philip S. Olt, Pekin, Ill., manufactures several types of calls that should satisfy. The Olt game calls are made and toned by one who is a hunter himself and who has had years of experience and study in making game calls to obtain the most natural tone and so do away with any metallic sound, and to overcome swelling and shrinking by dampness. By constructing them entirely of the hard rubber with reeds of a specially prepared hard sheet rubber, using also proper materials such as fine polished hard rubber throughout, the callers are easily blown with a true-to-nature natural tone and are not affected by climatic conditions.

Rubber Caller

A recent development, here illustrated, is Olt's New Mallard Duck Caller, manufactured of genuine hard rubber nicely polished. The tongue is of a special hard spring rubber and is securely held in place between two hard rubber lips, making it almost impossible to become out of tone.

For Baby's Comfort and Mother's Convenience

A MOTHER who knew and remembered the strain and sometimes irksome routine of caring for Baby Dear designed The Baby Bathinette, Kiddie-Bath and Table. Since she realized too the advantages of rubber, she made good use of it. Her product will prove a blessing to any one who has to take care of very young children.

The Baby Bathinette is a combination bathtub and dressing-table. The frame is of hard wood, finished in white or ivory enamel. The tub is of high-grade, pliant, double-faced rubberized fabric furnished especially for this purpose. It is hygienically safe because it is easy to clean.

After the child has been bathed, his mother lifts him out of the tub. With her free hand she then draws the canvas dressing-table over the tub. Here the baby is dried, powdered, and dressed. There are no unnecessary steps for the mother to take because cretonne or canvas pockets at the back of the dressing-table hold the necessary toilet articles. A leakproof soap-container and an enameled rack for towels and baby changes are important items. A special feature is the safety strap by which the infant is securely held to the table when it is necessary for the mother to leave him for a few moments. A faucet at the bottom of the tub facilitates draining out the water.

Kiddie-Bath and Table

This combination tub and table is easy to set up, fold, and carry, and stores in small space. It comes in four styles, two of which have a device for raising the dressing-table several inches above the tub rather than directly over it. The heights were made with a view to a comfortable sitting or standing position for the mother. E. M. Trimble Mfg. Co., Inc., Rochester, N. Y.

Stipuled Teething Ring

A NEW teething ring made of molded red rubber has small stipules raised on its surface to provide a massage effect on the child's gums. It is said to be the invention of a practicing dentist and to assure proper development of the dental arch while preventing overlapping crowded teeth. The "Baby-Bite" teething ring comes packed in sealed cellophane containers, one dozen to the box, and the rubber is sterilizable. A patent is pending. Louis A. Boettiger Co., 48 Leonard St., New York, N. Y.

Baby-Bite Teether

The Rubber Industry in America

OHIO

Paul W. Litchfield, president of The Goodyear Tire & Rubber Co., Akron, O., left Akron on September 5 for South America on a trip reported to be in connection with the purchase of a site for a factory in Argentina. Although details could not be obtained from Goodyear officials, it was learned that the trip will take about twenty days.

The Goodyear Tire & Rubber Co., Akron, O., has announced that dismantling of the Marathon Tire & Rubber Co., Cuyahoga Falls, O., was begun early in September. The Goodyear company declared that machinery, molds, and stocks are being removed from the Cuyahoga Falls plant to the Akron factory. The Marathon line will be continued at the Goodyear plant.

Many economies will be effected by the transfer of operations, Goodyear officials state. Plans for the disposal of the Marathon plant have not been decided upon.

Firestone Service Stores, Inc., Columbus, O., has reported the incorporation of another link in its chain. The new unit, capitalized at $25,000, will be located in Chillicothe.

The Firestone Tire & Rubber Co., Akron, O., on September 6, broke ground for a $750,000 addition to its factory. The new building will be seven stories, to be used for expansion of the tire manufacturing departments, and will add 3,500 tires to the Firestone daily production schedule.

The structure will be built as part of the present Plant 2. Addition of more than 2,000 men to the Firestone payroll is expected when the new department goes into production. The building will cost approximately $500,000 and the equipment $250,000.

Smith & Smith, 455 Chestnut Blvd., Cuyahoga Falls, O., has announced a new feature of "Reference Service," namely, the "Dictated Translation." This service is offered to those in the Akron area who can have the dictation taken by their own stenographer. To others, the service is offered on the basis of a time rate and a stenographer's charge. Its particular feature is its smaller cost.

The B. F. Goodrich Co., Akron, O., has completed consolidation with the Hood Rubber Co., Watertown, Mass. The merger took place as of September 1. Active management was taken over on September 3, with Arthur B. Newhall as vice president and general manager. Officers of the new Hood Rubber Co., Inc., and Hood Rubber Products Co. are J. D. Tew, president; T. G. Graham, first vice president; A. B. Newhall, vice president and general manager; and V. I. Montenyohl, treasurer.

F. C. Hood remains as a director of the new company but at his own request was not made an officer. Announcement was made on September 3, that the new Hood company will operate as a unit of the Goodrich company under Mr. Newhall's management.

The consolidation gives Goodrich probably the largest footwear production in the country, approximately 125,000 pairs daily. Hood tires and other items such as heels, soles, battery boxes, and other products will be continued.

All Hood preference and preferred stocks are to be retired.

George W. Sherman, broker in used industrial machinery, Akron, O., is selling for the owners the equipment formerly used by the American Tire & Rubber Co., also of Akron. The tire company recently went into the hands of a receiver.

The Swinehart Tire & Rubber Co. stockholders, Akron, O., held a meeting on September 7 in an attempt to formulate plans for refinancing the company and having the pending receivership application set aside. It was announced, however, that the stockholders failed to agree on any plan of refinancing.

The receivership application had been scheduled for hearing before Judge West on September 7, but had been set back to the following week when William Walsh, Swinehart attorney, filed an answer to the bankruptcy petition. The Swinehart answer was brief, merely entering a denial to the bankruptcy charges, and declaring that the company is not insolvent.

Now, however, a motion that a special master be appointed to hear the application for receivership was filed in Cleveland federal court by Paul Weick, of Herberich & Weick, attorneys for the creditors in the bankruptcy action.

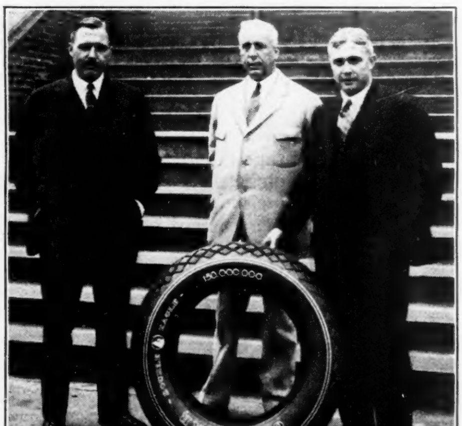
Appointment of a special master is the next step in the bankruptcy proceedings. It is expected that the application will be referred back to Harry L. Snyder, local federal referee in bankruptcy.

Goodyear Sets Tire-Production Record

THE Goodyear Tire & Rubber Co., Akron, O., on August 28 set a new record in automobile tire production when tire No. 150,000,000, a 7.00-20 Double Eagle, was turned out.

Something of the remarkable progress of the automotive industry and its allied rubber industry in the past few years is realized from the foregoing statement.

Goodyear reached the 100,000,000 mark in April, 1927. Twenty-four years were required to establish that record in comparison to the new mark for production showing 50,000,000 or half as much added to the total in the space of two years and four months.



C. C. Slusser holding the 150,000,000th tire; Paul W. Litchfield, president, center; and R. S. Wilson, vice president and sales manager, left.

"Stepping up production tells several stories of interest to industry and the public at large," C. C. Slusser, vice president and factory manager, stated.

"First, since the early years radical changes have taken place in production methods.

"Second, the rubber industry owes its life to the automobile. As automobile-building grew to the proportions it represents today, the forward-bound was felt by tire-making. Thus Goodyear's record is viewing automotive expansion from a different, but equally accurate, angle.

"Finally, the 150,000,000th tire is an illustration of the bigness of Goodyear itself and its growth into an international concern with plants in nearly every part of the world."

Paul R. Mahoney, executive vice president of The B. F. Goodrich Corp., has announced that negotiations have been closed for a factory site for his company in Argentina. The new factory will be located at Quilmes, a suburb of Buenos Aires.

The new plant, Mr. Mahoney said, would employ approximately 1,200 men and would be the first plant to be built by the Goodrich firm in South America. Tires and other rubber goods will be manufactured in the new factory.

The Falls Rubber Co., Akron, O., according to W. P. Cline, president, has engaged the services of F. C. Millhoff, former general sales manager of the Miller Rubber Co., and W. G. Lerch, former production superintendent of the India Tire & Rubber Co., both of Akron.

Mr. Millhoff will be assistant to President Cline in special charge of sales promotion work. In directing promotion work, Mr. Millhoff will spend much of his time in the field in contact with the dealer organization and the field sales force, Mr. Cline indicated.

Mr. Lerch will have the same position at the Falls plant as he had at India, and is slated later to be appointed a director of the Falls company, it was reported.

P. J. Kelly, advertising manager of The B. F. Goodrich Co., Akron, O., will be one of the speakers at the national convention of the Direct Mail Advertising Association, to be held in Cleveland, O., on October 9-11. More than 3,000 members are expected to attend. Mr. Kelly will talk on "Direct Mail as Retail Action Advertising."

The Seiberling Rubber Co., Akron, O. More than 5,000 employes and their families attended their sixth annual outing and picnic held at Chippewa Lake. A baseball game and other sports were conducted in the morning and a water carnival in the afternoon. The chief event was a beauty contest, won by the Misses Ruth and Evelyn Seifert and Madeline Sherman.

The Seiberling company will manufacture "Camel" storage batteries, so-called because they require water only once in ninety days. "Camels" are to be nationally advertised over a radio network on November 1.

Plant of the Fremont Tool & Die Co.

MAKER OF SERVICEABLE AND ACCURATE CUTTING DIES

Practice makes perfect—and the Fremont Tool & Die Co., 434-36 N. Wood St., Fremont, O., has been manufacturing cutting dies for rubber, leather, felt, cloth, etc., since 1910. The company specializes in cutting dies of all descriptions for the shoe, glove, garment, leather novelty goods, belt, cut sole, and sporting goods trade. It is a large producer and manufacturer of the mallet handle dies; Walker dies, 3½ inches high, either plain or corrugated steel; also clicking machine dies from 1 to 2¼ inches high.

It can be truthfully stated that few items in the rubber trade fill a more important role than do cutting dies. A cutting die, it has been said, is either all right or all wrong.

Here is a firm which has devoted twenty years to cutting dies, and consequently has mastered every detail to a degree which has given it the confidence and patronage of not only a large percentage of rubber manufacturers and others using cutting dies in the Midwest, but also in many other sections of the country.

The company is prepared to produce special dies when desired—in fact, to meet requirements promptly and to the fullest possible extent. The high degree of success which it has attained is no doubt attributable to this fact.

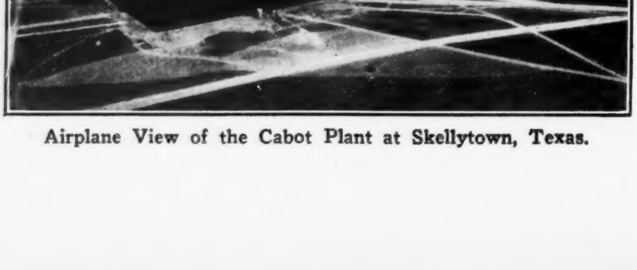
Fremont recently completed a modern factory addition, the fifth to the original plans since 1910, necessitated by increased business, in order to meet even more efficiently the exacting demands of its clientele.

IMPROVEMENTS IN CABOT CARBON BLACK PRODUCTION

The burning, scraping, and collecting operations in carbon black manufacture have been fully automatic for a great many years, but only recently Godfrey L. Cabot, Inc., has applied quantity production methods to packing, pressing, and handling the sacks. By concentrating production in large units the company has applied straight-line production methods and mechanical handling to the manufacturer of carbon black.

In a typical plant the gas burning buildings are arranged in eight groups, each group feeds into an alley conveyer and each pair of alley conveyers into a main conveyer. The four main conveyers enter the packing house through a system of gates designed so that black can be distributed into any of the regular or reserve sections at will. In each packing house section is an air separator which removes the grit and coarse particles, finally floating the fine black on a slow air current up through a thirty-foot by four-foot stack into the agitating tank, where it is condensed by stirring with electrically driven and electrically controlled paddles. From the agitating tank the black goes by gravity to the packers where it is sacked and weighed.

Large truck-loads of sacks are handled without power from the packing room to the box-car door. Mechanical handling has not yet been applied to all the operations. The necessary time has been reduced to a minimum by carefully designed machines, and the elimination of normal operations altogether is being carefully studied.



Airplane View of the Cabot Plant at Skellytown, Texas.

EASTERN AND SOUTHERN

General Atlas Chemical Co., 60 Wall St., New York, N. Y., has announced that James W. Mackay has joined its laboratory staff in Linden, N. J. He will be engaged in general compounding and investigations on the use of Gastex in rubber compounds. Prior to becoming affiliated with the General Atlas Chemical Co., Mr. Mackay was associated with the United States Rubber Co. in the footwear control laboratories at New Haven, Conn.

F. B. Davis, Jr., president and chairman of the board of the United States Rubber Co., New York, N. Y., recently sailed on the "Mauretania." He will spend about a month looking over the company's interests in Europe.

Mr. Davis has announced the formation of the Fiber Products Department, with R. P. Rose as general manager. With headquarters at the company's general offices in New York, the new department will carry on at Cleveland, O., and Rock City Falls, N. Y., the manufacture of unwoven fiber products containing rubber from natural or artificial latex. For several years the company has been conducting extensive experiments on products in which latex, rubber in liquid form, is used in conjunction with unwoven fiber, such as paper, and has reached a point where it is felt that commercial operations on a substantial scale are justified.

C. K. Williams & Co., Easton, Pa., manufacturer of mineral colors and fillers, has announced two new services. Warehouse stock is located at 70 Kent Ave., and the office at 88 Kent Ave., both in Brooklyn, N. Y. R. T. Nicols has charge of telephone orders made by calling Greenpoint 1404. Joseph M. Heim and Emil Hoefle will call on the trade regularly and render any service desired. The second feature is the establishment of a trucking service from Easton to New York, which makes all Williams products available from Easton by one-day service with delivery to the consumer's door. Trucks operate daily, and the running time between the two points is approximately four hours.

United States Rubber Co., New York, N. Y., has announced proposed bonus and managers' share plans subject to the approval of the stockholders. The plans include the payment of bonus awards in common stock of the company which will cause a greater number of employes to become stockholders, and thereby increase their interest in the earnings of the company available for dividends. The principal distributions are based upon the profits earned each year and no payments from profits will be made unless the earnings, before such distributions, are sufficient to show a reasonable return on the capital employed in manufacturing and selling operations. The provisions for return on invested capital is fixed at 5 per cent in 1929, 5½ per cent in 1930, and 6 per cent thereafter, which is well above the average return of 3.88 per cent during the past eight years. It is, therefore, obvious that employes must assist in materially increasing the earnings of the company before participating in profits.

Endicott Johnson Corp., Johnson City, N. Y., is building a four-story plant, 60 by 240 feet, for the manufacture of a complete line of rubber footwear. The present daily output of 15,000 pairs of canvas footwear will be increased to 27,000 pairs in the new plant, where rubber boots, overshoes, and rubbers will also be produced.

C. Harold Smith, president and director of Binney & Smith Co., 41 E. 42d St., New York, N. Y., dry color manufacturer, recently returned from abroad on the "Majestic."

F. R. Henderson, president of the Rubber Exchange of New York, has accepted the presidency of the New York & Republic Corp., a new investment trust, it was announced recently.

GOODYEAR IN THE SOUTH

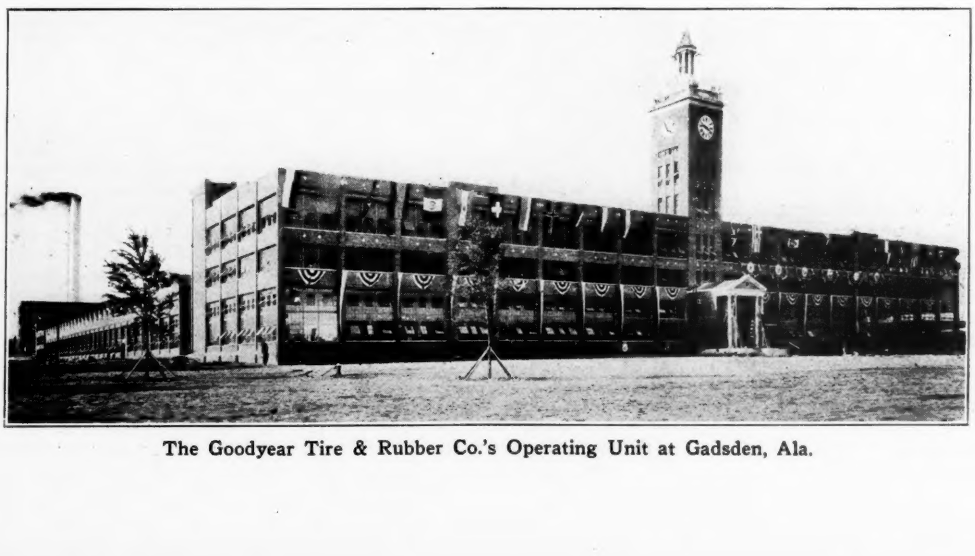
THE Gadsden, Ala., plant of The Goodyear Tire & Rubber Co. is the first major tire operation in the South. It includes an administration and warehouse structure across the front, 400 feet wide by 100 feet deep and three stories high; a manufacturing unit stretching back 560 feet deep, of one-story sawtooth roof construction, 400 feet wide; the raw material building 100 feet wide, 400 feet long, two stories high; and behind these the power house five stories high with a pure white smoke stack of 250 feet; and behind this the reclaim plant, which just began operations. More than 150 carloads of used tires were on hand for the start. When it reaches full production, it will turn out 50,000 pounds of reclaimed rubber daily, all of which will be shipped to Akron, O., for the manufacture of mechanical rubber goods. Three carloads will be processed daily and will be sent in from practically every shipping center in the South.

The initial daily capacity of the plant is 5,000 tires. Approximately 1,800 employes were on the payroll of this plant when production started.

Within an eighty-mile radius, in the heart of the great industrial area that is bounded by Chattanooga, Atlanta, and Birmingham, are four Goodyear factories either being built, or in process of expansion, or of being taken over entirely. It is expected to have soon 6,000 employes in these various mills.

Sixty-five miles from Gadsden at Cedartown, Ga., is the Clearwater mill, the first Goodyear southern cotton mill. Here the capacity was recently nearly doubled from 33,000 to 50,000 spindles.

At Rockmart, Ga., a new mill of 50,000 spindles is under construction and operations will begin on a small scale about October 15. At Cartersville, Ga., work of remodeling the Atco mill, which Goodyear recently purchased, is under way. When completed, the latter mill will have the same capacity as the other two. It too will start to function on a small scale by the middle of October.



The Goodyear Tire & Rubber Co.'s Operating Unit at Gadsden, Ala.

Turner, Halsey Co., 74 Leonard St., New York, N. Y., is selling agent for the Utica Knitting Co., Utica, N. Y., distributing fancy and plain nets to the rubber footwear and raincoat trade. Harold M. Turner, vice president of the company, is well known in the rubber trade.

The Firestone Tire & Rubber Co., has acquired the entire frontage of the block on Oak St., between Twentieth and Twenty-first Sts., Baltimore, Md., where it will erect a new and modern distributing warehouse. The building projected for the site will be a three-story concrete and steel structure having a frontage of approximately 233 feet, with a depth of 84 feet. It will represent an investment of about $250,000.

The Texas Rubber Specialty Co., 803 Franklin Ave., Houston, Tex., erected the first unit of its up-to-date rubber factory, the Texas Rubber Manufacturing Co., 920 Adele St., adjacent to the Oil Center Tool Co., also an associate factory, given over to the manufacture of steel oil-field specialties, tools, and exacting machine work. Intricate steel molds used in the rubber factory are made in this department. Complete facilities are available to produce within twenty-four hours any rubber product compounded from crude rubber.

The Texas Rubber Manufacturing Co. now makes a wide variety of rubber goods with particular attention given to the rubber requirements of oil tool manufacturers. Rubber hose, rubber slush pump sleeves, valve inserts, pump valves, and gland packings are being molded in a black rubber compound having a tensile strength of 5,000.

U. S. Rubber Club Outing

The U. S. Rubber Club of Mass., Inc., held its first annual outing at Beverly, Mass., on September 21, 1929. Activities included sporting events as well as a buffet luncheon and a dinner. The organization obtained the use of the facilities of the clubhouse and grounds of the United Shoe Machinery Corp. Athletic Association at North Beverly. About 250 members attended. J. J. Drummey, president of the United States Rubber Club of Rhode Island, and John J. Yeaton, of the United Shoe Golf Division, were invited guests.

The committees in charge of the outing follow:

Ground and Refreshments, G. E. Manser, chairman, Arthur Moore, C. W. Delory, R. J. Barry, B. A. MacDonald. Sports, H. H. Nance, chairman, R. B. Currie, John Fox. Transportation and Tickets, J. F. Ryan, chairman, F. E. Dyer, William Connelly, Fred S. Meehan, John Clancy. Publicity, Fred J. Pickard, chairman, A. Lee Cowles, John J. Lehan.

The officers of The U. S. Rubber Club are: Enoch B. Robertson, president; Henry Guilford, vice-president; J. Ben Winters, treasurer; Harvey Eddy, secretary; Frank T. O'Connell, financial secretary.

NEW ENGLAND

United States Rubber Co., through H. E. Crooker, New England district sales manager, on September 7 announced the appointment of H. E. Cook as branch sales manager at Boston, Mass. Mr. Cook has seen twenty-six years of service with the United States Rubber Co. He has been branch sales manager for five years each at Baltimore and Washington.

The Pennsylvania Rubber Co., Jeannette, Pa., held its seasonal sales convention on September 20 at Hotel Lenox, Boston, Mass. In conjunction with the convention a conference of more than one hundred New England tire dealers was conducted.

The Firestone Tire & Rubber Co., Akron, O., according to A. T. McGrath, Boston branch manager, has announced the promotion to special sales work of G. L. Margeson, who has been office manager of the Firestone Boston branch. R. S. Skooglund succeeds Mr. Margeson as office manager. Mr. Skooglund has been with the Firestone organization in New England for many years and comes from the Hartford branch.

The Firestone company will build a $75,000 service station in Fitchburg, Mass., at the corner of Main and Academy Sts. Philip J. Hannon, long identified with the motor industry in that city, will be the manager. The station will be one of the first of its kind in New England. Firestone now has forty-seven of this type under construction. These form the nucleus for a proposed coast-to-coast chain of "one-stop" master stations giving complete tire, brake, lubrication, battery, washing, and polishing service.

United States Rubber Co. engineers have been engaged during the past several weeks on plans to facilitate the plant's operations in Providence, R. I. Contracts have been awarded for new work at Valley and Eagle Sts. that call for upwards of $100,000 outlay. While several buildings are in project at present, work is confined to a one-story brick building 100 by 300 feet on Valley St. to cost $90,000 and to a three-story brick addition 19 by 32 feet to one of the buildings already erected. This is to be used for a toilet tower and will cost $10,000, and another addition, one-story high 31 feet square, is being erected at a cost of $3,600.

Hartford Rubber Works, Hartford, Conn., through Luther B. Martin, factory manager, has announced a plan whereby an amount of $103,099 is paid to its employes thrown out of work by the plant's removal to Detroit.

The termination wage of one week's pay for each year of work is given to all employes who have been with the company for ten years, and are over forty-five years of age. Any employe of more than fifteen years, receives the termination wage regardless of his age. Individual cases which nearly fall in one of the two classes are under consideration of the company's board of pensions. The termination wage is based on 1928 earnings of employes for at that time the company had its largest payroll and individual earnings were the highest they have ever been.

Twelve employes were pensioned on September 1, increasing the pension list to thirty-seven. Pensions are granted to employes sixty years of age who have worked at the company for twenty years.

The amount paid during the week ending September 7 was $63,099; the amount to be paid is $40,000. Individual termination wages range from $250 to $2,000.

The National India Rubber Co. has announced the following changes: William H. Sisson has been appointed foreman of the wire shipping department. Romeo D. Asselin has been placed in charge of the table department, with William McKenna as the assistant foreman in these two departments. William T. Burke has been made foreman of the wire finishing department. William McCarthy becomes foreman of the wire twisting and the royal cord inspection department, and Domenic Vitullo has been made foreman of the night operations in the wire division.

The Collyer Insulated Wire Co., Pawtucket, R. I., and the **Providence Insulated Wire Co.**, wholly owned by the former, have split up their stock by issuing ten new shares for each old share of $100 par value. Henceforth these two concerns will have the same amount of capital but ten times as many shares of stock of no par value instead of the former $100 value. In the case of the Collyer Insulated Wire Co. total capitalization will be $1,500,000 in 150,000 shares, and the Providence Insulated Wire Co. will have a capitalization of $250,000 consisting of 2,500 shares.

The American Wringer Co., Woonsocket, R. I., has been granted a trade mark for rubber rolls for laundry, textile machinery, and printing presses. Directors of this corporation have voted an initial 75-cent cash dividend on the common stock, payable October 1 to stockholders of record September 14. This places the Woonsocket company in the dividend paying class for the first time since before its reorganization and marks the successful rehabilitation of the concern under the new management. The company has disposed of its hand-wringer business and is confining operations to a diversified line of products, the most important of which being rubber rolls for use in paper mills and printing establishments. A Canadian plant has recently been placed in operation. Officials of the company state that earnings are running at a substantial figure for 1929 and that the outlook is very encouraging for months to come.

Providence Insulated Wire Co. will erect a two-story brick addition to its plant in Providence, R. I., the addition to be 40 by 72 feet and to cost approximately $12,000. The company has changed its capitalization from $250,000 to 25,000 shares of common stock with no par value.

The Ninigret Co's. plant on Front St., Pawtucket, R. I., is now running on a full-time schedule on a big order, which will take at least six weeks or two months to complete. Up to within about a month the plant has been operating both night and day shifts for the past six years, furnishing employment for about 600 hands. The company is a subsidiary of The Fisk Rubber Co., Chicopee Falls, Mass., and has been manufacturing tire fabrics.

The Para Thread Co., Inc., has been formed in Woonsocket, R. I., for the purpose of marketing an elastic thread now being produced by the American Wringer Co., of that city.

Mechanical Fabric Co. has given a contract for a dry curing oven in its plant on Sprague St., Providence, R. I., and the installation is now going on.

New Fisk Advertising Head

The Fisk Tire Co., Inc., Chicopee Falls, Mass., has announced the appointment of C. H. Johnson as advertising manager. Mr. Johnson resigned from Young & Rubicam, Inc., advertising agency, New York, N. Y., to accept his new position with Fisk. He has had considerable experience in the advertising business, having been for ten years with the New York office of George Batten Co., Inc., and later with Griffin, Johnson & Mann, Inc., advertising agency, also in New York, as vice president. Mr. Johnson has already assumed his new duties. He will make his home in Springfield, Mass.

C. H. Johnson

United States Rubber Co. has issued a notice that a special meeting of stockholders will be held at 11 A. M. on October 15 at the company's principal and registered office, Little Burnet St., New Brunswick, N. J. The purpose of this meeting is to approve and adopt proposed bonus and managers' shares plans.

NEW JERSEY

Conditions remain good in the rubber industry throughout New Jersey, and the manufacturers are optimistic over the future. The hard rubber situation has shown wonderful improvement during the past month, and some plants are operating overtime to fill orders. Sales of tires and tubes continue brisk by the retailers. The demand for certain mechanical rubber goods has increased. There has been no decrease in orders for shoes and heels and soles. Despite this fact, rubber reclaiming manufacturers report that they are experiencing some slackness.

Bruce Bedford, president of the Luzerne Rubber Co., Trenton, N. J., has returned from Europe, where he spent two months with his wife and two sons.

Horace B. Tobin, president of the Woven Steel Hose & Rubber Co., Trenton, N. J., has returned with his wife and daughter from an extended tour through Europe.

The Pocono Rubber Cloth Co., Trenton, N. J., reports that business remains good. H. B. Slusser, vice president and treasurer of the company, returned from a month's trip to California with his family. While on the Pacific Coast, he also made some business calls.

The Puritan Rubber Co., Trenton, N. J., continues to operate to capacity in each department. The company is now occupying its new office addition, having been crowded for room for some time.

The Joseph Stokes Rubber Co., Trenton, N. J., has so many orders to fill that it is working seven days and six nights a week. The company recently completed two factory additions and is having machinery installed in them. New equipment is also being placed in the addition to the plant at Welland, Ont., Canada. The latter plant is operating 100 per cent.

Whitehead Bros. Rubber Co., Trenton, N. J., reports capacity production. The company is working on a large order for belting that will require some time to fill.

Albert B. Norwalk, New York, N. Y., has been appointed vice president in charge of sales for the Murray Rubber Co., Trenton, N. J. Mr. Norwalk is prominently known in the rubber industry and comes to the Trenton concern with a large field of experience. He succeeds Albert J. Dornseif, who resigned to become affiliated with the Kelly-Springfield Tire Co., also of New York.

The Mercer Rubber Co., Trenton, N. J., announces that business for this season of the year is very good. The plant is operating under normal conditions.

Art H. Massey, general sales manager of the Combination Rubber Co., Trenton, N. J., has returned from a three weeks' trip through the South and Southwest. He called upon the trade and found conditions very satisfactory.

The Murray Rubber Co., Trenton, N. J., reports that business is very good both in the tire and tube and mechanical rubber goods departments. The company has thus far established 650 chain tire stores through the eastern section and is opening them up at the rate of about 50 a week.

R. J. Stokes, president of the Thermoid Company, Trenton, N. J., has announced plans for merging the Southern Asbestos Co. with the Thermoid Company, thereby forming the second largest brake-lining manufacturing company in the country and one of the largest earning properties in the asbestos industry.

The Thermoid Company already owns controlling interest in the Southern Asbestos Co. In a letter addressed to the minority stockholders, Mr. Stokes states that his company is offering to exchange four and one-third shares of its 7 per cent cumulative convertible preferred stock for ten shares of Southern Asbestos common stock. The offer expires on October 10, 1929.

Mr. Stokes has announced also an expansion of the executive personnel, due to the rapidly increasing business of the company. Robert Lee, who has been general sales manager for the past five years, has been elected vice president. J. A. Wheatley, Jr., more than ten years with the company, has been promoted from Pacific Coast manager to sales manager of the automotive division. Lloyd R. Leaver, Chicago manager of mechanical rubber goods, has been made sales manager of the mechanical rubber goods division. Willard Kelly succeeds Mr. Wheatley on the Pacific Coast.

American Society of Mechanical Engineers

The American Society of Mechanical Engineers will hold its regional meeting in Akron, O., on October 21 to 23. Plans for entertainment and excursions include trips to The Firestone Tire & Rubber Co., The Goodyear Tire & Rubber Co., The Goodyear-Zeppelin Corp., The B. F. Goodrich Co., and The Miller Rubber Co., all of Akron.

The following papers of rubber interest will be presented at the sessions to be held on October 21 and 22.

Materials Handling in the Plant of The Goodyear Tire & Rubber Co. C. C. Stuber.

Apprenticeship in the Rubber Industry. C. C. Slusser.

Conveying in Tire and Rubber Factories. F. E. Moore.

Rubber in Airplane Construction. A. M. Keller.

Airplane Tires and Wheels. H. F. Schippel.

The Third National Fuels meeting will be held at Philadelphia, Pa., October 7-10.

MIDWEST

The Anaconda Copper Mining Co. on September 5 announced the acquisition, through its subsidiary, the Anaconda Wire Cable Co., of the assets and business of the Marion Insulated Wire & Rubber Co., Marion, Ind. The negotiations, which covered several months, were concluded on a basis of stock exchange and cash, the details of which were not announced.

The Marion concern gives the Anaconda company its first unit in the Midwest and provides a plant in that territory for the manufacture of rubber-covered wires and cables. In line with the policy of the Anaconda company, the announcement stated, the management of the Marion company will be merged with the organization of the Anaconda Wire & Cable Co.

The Electric Machinery Mfg. Co., Minneapolis, Minn., manufactures synchronous motors for rubber mill drives. A recent installation consisted of eleven motors 150 h.p., 1,000 r.p.m., for driving single 84-inch mill lines; three motors 800 h.p., 100 r.p.m., for direct connection to Banbury mixers; one motor, 600 h.p., 125 r.p.m., to drive a mill line. All the synchronous motors were controlled with the frequency relay type starters.

The Baldwin Rubber Co., Pontiac, Mich., manufacturer of rubber floor coverings for automobiles, has issued the following report. The six-month period ending June 30, 1929, both from a sales standpoint and net income, was the largest in the history of the company. The net earnings during the first half of 1929 showed a 40 per cent increase over the same period a year ago. Total earnings for the first six months of 1929 amounted to $179,500 as compared with $128,100 for the same period last year.

The company is now operating as a subsidiary the Michigan Rubber Co., Owosso, Mich., which it had purchased in May.

Sears, Roebuck & Co., Chicago, Ill., has announced the opening during the next few months of eighteen additional tire and accessory stores. Investments in new retail units during the last four months totaled $15,000,000. Seven new tire and accessory stores are to be established in Chicago, five in Boston, three in Philadelphia, and three in Detroit. Many of the leases have already been signed and the company is preparing for occupation within a few weeks.

Since January 1, the company has opened twenty-two million-dollar retail department stores in large cities and sixty-two somewhat smaller retail units in twenty-four states.

Press reports credit the mail-order house with plans for invading also New York. It is reported that the campaign will begin with the opening of small outlets for automobile accessories including tires, known as Class C stores. Later Class A and Class B stores will also be opened, it is expected. Class A stores are very large establishments opened on the outskirts of congested business sections. They include parking areas, free tire service stations, and other conveniences. Such stores have achieved a great measure of success in Philadelphia, Chicago, Boston, Los Angeles, and other cities of like size.

The B. F. Goodrich Rubber Co., Akron, O., has leased 5,000 square feet of office and warehouse space in the Kedney Warehouse, 605 Washington Ave. N., Minneapolis, Minn. The new location will permit more convenient and faster distribution of Goodrich footwear and tires. Remodeling to cost about $5,000 will be done before the company occupies the new quarters. Goodrich has leased also two other sites in the city for tire stations. A fifteen-year lease was taken on the property at 207-15 Washington Ave. S., where a $25,000 super-service station will be erected immediately. The second tire station will be built later at 33-37 S. Eleventh St.

M. A. Marquette, for over two years factory manager of the Corduroy Tire Co., Grand Rapids, Mich., has resigned to become associated with the Engelbert Tire & Rubber Co., Liege, Belgium.

GILLETTE RUBBER CO. EXECUTIVES

At the annual stockholders' meeting of the Gillette Rubber Co., Eau Claire, Wis., held on September 10, the following directors were reelected as members of the board: R. B. Gillette, R. W. Hutchens, I. T. Gilruth, Wm. Koontz, John Rossi, A. L. Martin, and H. D. Whitehouse. F. A. Hawley is a new member of the board, elected in place of F. C. Hermann, who retired as president on September 10 because of ill health, which for four years has prevented his active participation in Gillette affairs. The ex-president sold his interest in the company to R. B. Gillette, R. W. Hutchens, and I. T. Gilruth, who have been the guiding destinies in the development of the company.

R. B. Gillette

At the board of directors' meeting, held after the stockholders', R. B. Gillette was elected chairman of the board; R. W. Hutchens, president and general manager; S. G. Moon, vice president; I. T. Gilruth, vice president and counsel; C. B. Reynolds, secretary and treasurer; and H. C. Olson, assistant secretary and assistant treasurer.

Mr. Gillette started the rubber company which bears his name in 1916. He has been its vice president ever since. A few months ago the title of treasurer was also given to him, and he is now chairman of the board of directors, in which position he will be able to make the most of his ability in further developing the interests of the company.

The new president of the company is only thirty-eight years old, but he has devoted twenty-one of those years to the rubber industry. In 1908 he joined the engineering department of the G & J Tire Co., Indianapolis, Ind. Then he went to the Federal Rubber Co., Cudahy, Wis. In April, 1917, however, he severed that connection to become supervising engineer at the Gillette plant. In 1920 he was placed in full charge of factory operations, and a few years later was elected secretary and factory manager. When the company was reorganized in 1925, Mr. Hutchens was made vice president and factory manager, which positions he held until his recent election to the presidency.

On September 14 about fifty-five Gillette department heads gave a banquet in honor of R. W. Hutchens and R. B. Gillette. Music was furnished by the orchestra of the Gillette Broadcasting Station. The balance of the evening was devoted to short talks. Mr. Hutchens and Mr. Gillette gave a brief history of the company and told of the deep appreciation they felt of the honor paid them and the cooperation accorded the company by the employes. They emphasized also the company's policy of promoting men as soon as they demonstrated their ability and fitness for more responsible positions.

R. W. Hutchens

PACIFIC COAST

Samson Tire & Rubber Corp., Los Angeles, Calif., is rapidly overtaking its high production schedule, somewhat halted by installation of the new mechanical equipment. The factory section has been practically finished, and production has been steadily extended with the object of having operations in full swing before October 1. Construction of the six-story administration building, which had been temporarily delayed so that attention could be concentrated on the factory end, has now been resumed, and the pouring of cement for the walls will be finished in a couple of weeks. Setting at rest a rumor to the contrary, the company states that it intends to continue operating its Compton plant for an indefinite period, as also its San Diego plant.

United States Rubber Co. reports that its tire sales on the Pacific Coast have made a remarkable increase of late, due in part to a substantial reduction made in the prices of discontinued patterns. L. M. Simpson, general sales manager of the tire division, came recently from New York City to confer with company executives on the Coast. In other lines the company has also been doing considerable business recently. In rubber flooring there has been especial activity. Some of the recent large sales in the Southwest have been: 16,000 square feet for the library of the Southern Branch of the University of California at Westwood, a Los Angeles suburb; covering for all the offices of the big Ford assembly plant being erected in Long Beach; and 8,000 square feet for the new California Stock Exchange in Los Angeles.

Southwestern Rubber Co., 516 E. Fourth St., Los Angels, Calif., tire repaid stock manufacturer, announces that F. J. Keefe has bought the interest of his partner, H. P. Gates, and will continue business under the old name.

Goodyear Tire & Rubber Co. of California is operating its Los Angeles factory at full seasonal capacity, which is said to be well in excess of its maximum in 1928. It will celebrate on November 1 the tenth anniversary of the starting of the factory. Recent visitors at the plant have been R. S. Wilson, vice president and sales manager; W. D. Schilts, secretary; and B. J. Cox, manager of the equipment department; all of the parent Goodyear company of Akron O. Edwin J. Thomas, vice president and general superintendent of the California company, spent the latter part of September in Akron attending a conference of production managers of all Goodyear plants here and abroad.

The Coast Tire & Rubber Co., Oakland, Calif., which has been developing the Krone Ever-Safe inner tube described in this journal last month, announces that this unique safeguard against blow-outs will now be put in production. Already plans have been made for an extensive selling campaign. President Louis S. Budo left a week ago to supervise several demonstrations of the tube, which had been requested by large automobile-making concerns in the Midwest. It is intimated that the tube may be made part of the standard equipment on some well-known makes of cars.

Miller Tire & Rubber Co. products have made an unprecedented sales record for the summer season in the Southwest, according to Hugh A. Price, Los Angeles branch manager. Mr. Price is the latest addition to the exclusive Beverly Hills colony, having just completed a handsome home there.

L. Albert & Son, Trenton, N. J., dealer in rebuilt rubber machinery, recognizing the needs of the fast-growing rubber industry in the Southwest, has set up a branch plant on Alameda St., Compton, a suburb of Los Angeles, Calif. It is exceptionally well stocked with mill equipment, and is in charge of Herbert N. Wayne, a rubber industrial expert who has had extensive American and European experience.

H. S. Gardner, renewal sales manager of the Willard Storage Battery Co., Cleveland, O., left San Francisco, Calif., on September 11 for the Hawaiian Islands, where he will spend a month on business and pleasure.

American Rubber Mfg. Co., Oakland, Calif., is operating its plant eighteen hours a day, orders for heavy hose and belting being particularly numerous and urgent. Col. J. L. Dodge, treasurer, who has also been factory manager for several years, has returned to Los Angeles and will have general charge of the branch there. Leland Bros., who were long sales agents for American belting, have taken up other lines, and Col. Dodge will specialize on that branch of the business in the Southwest.

Brown Tube Corp., Graybar Bldg., New York, N. Y., is meeting with considerable success in the introduction of its puncture-proof tubes on the Coast, according to Special Representative E. D. Eddy, 50 Hawthorne St., San Francisco, Calif. A strong advertising campaign and the establishment of a well-stocked warehouse at the latter address are said to have helped much.

Neon Specialty & Mfg. Co., Inc., manufacturer of electric signs, 115 Western Ave. W., Seattle, Wash., also makes small molded rubber articles and matrices for the same in connection with its regular line. A. T. Hartwick is president-treasurer; J. B. Carlson, vice-president; and C. C. Sommerville, secretary.

Cascade Rubber Co., 35 W. Lander St., Seattle, Wash., is equipping several new paper mills with large rubber rolls and recovering rolls for a number of the older paper mills in the Northwest. Much of that work has hitherto been done only by Portland, Ore., and San Francisco concerns. Harold C. Dodge is president, and M. D. Barash, treasurer-manager.

Inland Rubber Co., Chicago, Ill., has opened a new branch at 1102 American Ave., Long Beach, Calif. C. P. Turner, vice president of the company, who makes his home in Los Angeles, is on a business visit to the plant in Chicago.

Boston Woven Hose & Rubber Co., Cambridge, Mass., reports that its 1929 Coast business in all lines handled is well above the total for the January-October period in 1928. J. B. Lippincott of the J. B. Lippincott Co., Coast representatives, 481 Market St., San Francisco, Calif., recently left on a trip through the Northwest and intended also to visit the factories in Cambridge.

General Motors Corp., which has arranged to buy the old poor-farm tract near Pasadena, Calif., for its Delcolight division, will, it is said, also manufacture as well as assemble hard rubber battery cases at the projected plant.

Dayton Rubber Co. of California, a subsidiary of the parent Dayton company in Akron, O., announces the appointment of William E. Allen, prominent tire expert, as Los Angeles sales manager. He succeeds Robert B. Grimes, who has been appointed San Francisco sales manager.

The Fisk Tire Co. announces the appointment of Catlin Wolfard as zone manager in the Coast field, and John S. Bathrick as Portland, Ore., manager.

R. B. Hargreaves, former Coast manager for Manhattan Rubber Mfg. Co., Passaic, N. J., has become sales manager for the Brake Supply Co., 1426 Santa Fe Ave., Los Angeles, Calif.

Firestone Tire & Rubber Co. of California has completed the sidewalls and flooring for the big extensions that it has been making to its plant in Los Angeles, and C. A. Myers, chief engineer in charge and vice president of the parent Firestone company in Akron, O., is confident that the new structures will be finished before the end of November. It is planned to tie up the new wings with the present buildings for continuous production by the end of the year and to make some radical changes in routing and other operations that will easily increase the present daily output of 6,000 tires and 7,000 tubes to 15,000 tires and 17,000 tubes. The plant is now taxed to capacity, even with all departments working three shifts a day.

The factory was closed on Saturday, September 7, to allow the employes and their families to have a picnic at Brookside Park, Pasadena. Over 3,000 attended. General Sales Manager R. C. Tucker recently returned from the Hawaiian Islands, where he had been making a study of trade conditions. Dr. F. W. Stavely, laboratory and development manager, will be assisted by H. M. Stilley of the control and research department at the Akron plant. Dr. Stavely recently left for Atlantic City, N. J., to attend the Rubber Division, A. C. S., meeting.

Pacific Goodrich Rubber Co. reports that production of tires at its Los An-

geles plant is being rapidly stepped up to meet the rising demand of Coast and trans-Pacific distributers, and additions are being made continually to the mechanical equipment. An important change has been made in distribution from the Goodrich Los Angeles branch at 1386 E. Seventh St., whereby the aid is enlisted of the Victor Belting & Rubber Co., 747 Warehouse St., leading jobbers in several lines, whose organization is expected to considerably augment the sales of mechanical products of the Goodrich concerns of Akron and Los Angeles. R. J. Loomis, former Oakland branch manager, has been transferred to Denver to head the Goodrich branch there. Pacific Goodrich Rubber Co. and the Richfield Oil Co. have jointly leased a $300,000 four-story building in Spokane which will be operated as a super-service station. First Vice President T. C. Graham of the parent Goodrich company in Akron has recently been studying cotton growing conditions in Arizona and Southern California with a view, it is said, to the establishing, if feasble, of company plantations in either of those places to supply material for tire textiles.

Coast Rubbermen's Golf Tournament

Pacific Coast Mechanical Rubbermen's Golf Association will have its annual golf tournament at the Rancho Country Club, Los Angeles, on November 1 and 2. Trophies will be donated by the Pacific Coast Rubber Co., L. P. Degen Belting Co., Plant Rubber & Asbestos Works, Boston Woven Hose & Rubber Co., the J. B. Lippincott Co., and the American Rubber Mfg. Co. A keen competition is assured for the perpetual challenge plaque won last year by K. E. Johnson, of the Pioneer Rubber Mills. President W. C. Hendrie says that he is confident of an unusually large attendance.

Obituary

Eminent German Editor

It is with regret that we announce the death on August 20, after a brief illness, of Georg Springer, director of our German contemporary, *Gummi-Zeitung*.

Georg Springer

The deceased, who was only 58 years old, joined *Gummi-Zeitung* in Dresden a few years after it was founded by Gampe, his work being chiefly translation from foreign languages. In 1894, when *Gummi-Zeitung* was entering its ninth year, he had become its editor and from then on the paper developed rapidly until it now ranks as the foremost German rubber trade paper. About the same time that Mr. Springer became editor of *Gummi-Zeitung*, he started the *Farben-Zeitung*, which also began in a very modest way, and then he gradually developed the whole series of numerous technical papers which practically form the backbone of the technical department of the Union Verlagsgesellschaft.

In his early days as editor of *Gummi-Zeitung*, he wrote much for the paper, but, as his work developed, he realized that his most important task was to gather about him a thoroughly efficient staff, and he recruited collaborators from every department of the industry and trade to cooperate under his stimulating direction.

Georg Springer was not only a sound man of business, a technical man, and to a certain extent a scientist, but he was also keenly interested in art, and this interest found expression in his work as director of the People's Dramatic Association and as president of the People's Free Drama.

He was a director of the Trade Paper Section of the National Association of German Trade Paper Publishers. An indefatigable, zealous, and selfless worker, he was an inspiration to those who worked under him, and they feel his going keenly.

Lewis Kelemen

From across the seas come sad tidings. Lewis Kelemen, general manager and first managing director of the Hungarian Rubber Goods Factory, Ltd., Budapest, Hungary, recently died. Mr. Kelemen, who was born in Budapest in 1882, majored in mechanical engineering at Technical University in his native city. Besides his position as general manager, he held also directorships with Dr. Dorogi & Co. Rubber Factory, Ltd., Cordatic Hungarian Rubber Tire Co., Palma Rubber Co., Ltd., and the Association of Hungarian Manufacturers.

George McConnell

Word was received of the recent death in Warren of George McConnell, superintendent of the Fidelity Tire & Rubber Co., Warren, O. He had been ill a long time. A widow survives. The funeral was held at Warren followed by interment in Mansfield.

Mrs. John A. Lambert

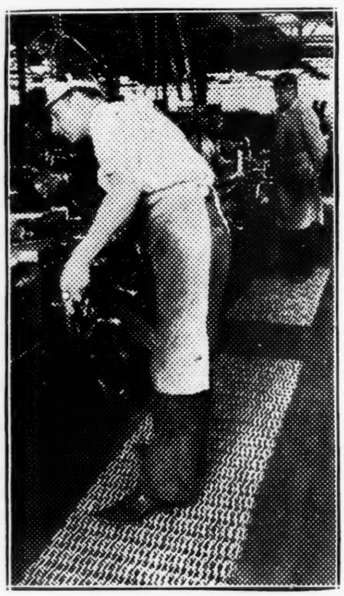
Mrs. John A. Lambert, wife of John A. Lambert, vice president, treasurer, and general manager of the Acme Rubber Manufacturing Co., Trenton, N. J., died on September 10 at her home, 912 Bellevue Ave., Trenton, after a long illness. Mrs. Lambert was a native of Freeport, Ill., and lived in Trenton for twenty-seven years. She is survived by her husband and seven children.

Safety-Mat Firm Expands

Clyde L. Morris, president of the Durable Mat Co., Seattle, Wash., said recently that the Seattle plant has been running at full capacity for the past four years.

The new Akron plant, recently established at 765 Miami St., Akron, O., has been well received by the trade, and is tremendously busy at the beginning of operations. The factory uses reclaimed and selected automobile casings, and manufactures Durable safety mats and Durable safety stair-treads.

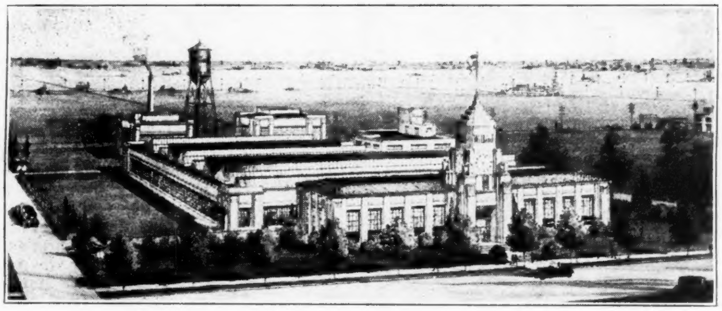
The Durable company will maintain an exhibit of Akron-made mats at the Eighteenth Annual Safety Congress, Chicago, Ill., on September 30 to October 4, 1929.



Durable Mat in Service

The use of rubber mats has increased greatly because of their superior cleaning qualities.

Besides the plants in Seattle and in Akron, the Durable Mat Co. maintains a plant in Victoria, B. C., to handle Canadian business.



Plant of the Willard Storage Battery Co., Los Angeles, Calif.

Willard Battery Company Erecting Southwest Factory

Under the direction of C. H. Starr, vice president and general manager of the Willard Storage Battery Co., Cleveland, O., ground was broken on September 6 for a million-dollar factory at E. Ninth and Gerhardt Sts., Los Angeles, Calif. It will be the company's second branch plant, the other being in Toronto, Canada. The ceremony was witnessed by a large assembly. C. C. Hine, vice president of the chamber of commerce, presided and introduced T. A. Willard, founder and past president.

The first unit will be 150 by 300 feet, and work will be rushed so that the plant will be practically complete within sixty days. Mr. Starr will be general manager of the new plant. Norman G. Wolf, who has been district manager on the Coast, will be renewal sales manager. Carl F. Norberg, who has been chief engineer at the Toronto plant, will be works manager. The plant will start with about 250 workers and aims to turn out in the first year about $3,000,000 worth of batteries.

CANADA

Rubber goods manufacturers report some recession in sales of garden hose and a steady demand for other kinds. But business in other mechanical rubber goods is said to be still good. The market situation in regard to these goods is fairly steady, with very little movement reported in crude rubber prices. Only slight variations occur at present in the cotton market.

All manufacturers are showing samples and issuing catalogs of tennis, outing, and sport goods shoes for 1930 in which merchandising interest and color appeal are bound in extensive range. Crepe soles are still being featured in a variety of lines, but in some they are less conspicuous than formerly. Manufacturers estimate the percentage of placing on outing shoes for 1930 higher than in the past. A market exists for sport shoes that will retail from $3.50 to $5.00. Shoes of the type that can be utilized for basket-ball or soft-ball wear have special fitting and arch-supporting features, making them attractive as well as serviceable.

Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, Ont. Directors of this company have declared the regular quarterly dividend of $1.25 on the common shares of no par value and a quarterly dividend of $1.75 on the preferred stock. In addition a bonus of $5 will be paid common shareholders, making a total disbursement for the year of $10 a share on the common stock. Last year the company paid quarterly dividends on the common amounting to $5 with a bonus of $1 the final quarter of the calendar year.

Jos. Stokes Rubber Co., Ltd., Welland, Ont., through A. R. MacDougall & Co., Ltd., Toronto, displayed in the Office Equipment Building at the Fifty-first Exhibition (Canadian National Exhibition), Toronto, rubber bands and erasers.

Quesnel & Frère, 821 Notre Dame St. W., Montreal, P. Q., has been appointed distributers in the Province of Quebec for the Perfection Rubber Co., Ltd., Lachine, P. Q., and also in eastern Ontario and the Quebec province for Woodstock Rubber Co., Woodstock, Ont.

Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont., in addition to maintaining a large fleet of cars and cycles for testing its tires, has produced a patent tennis-ball and racket-testing machine which tests racket and ball at the same time.

Goodyear Cotton Co. of Canada, Ltd., has announced the removal of its main office from New Toronto, Ont., to St. Hyacinthe, P. Q.

Dominion Rubber Co., Ltd., Montreal, P. Q. In less than two years this firm has organized about four hundred Dominion Tire Depots from Windsor, Ont., to the Gaspe Coast. They form the largest independently-owned retail tire-distributing system in Canada, to afford super-tire service to the motoring public and to increase the sale of Dominion tires.

Dunlop to Open Chain-Store System

Chain-store distribution of tires and tubes to motorists is the order of the day. In accordance with this practice the Dunlop Tire & Rubber Corp. will delay building a tire plant on its land in Los Angeles, Calif., until 1931. Meanwhile, the Dunlop General Sales Co. will cease serving eleven of the far western states and on November 1 will begin the distribution of Dunlop tires through a nation-wide Dunlop chain-store system. This revolutionary change in Dunlop methods will be marked by big price reductions and an aggressive sales campaign.

A. Koehler, general sales manager, Canadian Goodrich Co., Ltd., Kitchener, Ont., says that tennis footwear is thoroughly reestablished in public favor following the off-seasons, and it seems logical to predict that the close of the very satisfactory 1929 season marks the beginning of better times for the footwear merchant especially with rubber-soled canvas footwear.

John Myles, general manager, Columbus Rubber Co., Montreal, Ltd., states that fashion is playing a larger part each season in the problems of the rubber footwear manufacturer and the shoe retailer. He predicts a good volume of business next season in rubber carriage boots.

"Late last season," he said, "we saw the introduction of this type of boot with velvet upper and fur trimming, which undoubtedly caught on in the city and district of Montreal. The latest models for next season's business are very much improved on last year's styles and will readily sell in centers where they have already become popular. and the retail trade is therefore looking forward to an extra-heavy turnover of this style of boot."

Miner Rubber Co., Ltd., Granby, P. Q., recently held its annual picnic at Lake Bonnallie, where the superintendents, foremen, and office staff were entertained at the summer home of Mr. and Mrs. W. H. Miner. After lunch came a varied program of sports including a baseball game in which Mr. Miner was the "Babe Ruth" of his team. The gala event of the day was a presentation by Mr. Miner on behalf of the company to eight employes for twenty years' continuous service. A gold watch suitably engraved, a substantial check, and a finely executed certificate of service were presented to each veteran.

Northern Rubber Co., Ltd., Guelph, Ont., recently completed the extension to its factory. This includes an addition 60 feet long to the main building and a warehouse 60 by 120 feet.

Ernest A. Purkis, Ltd., Toronto, Ont., sales representative for Slazengers (Canada), Ltd., states that the Slazengers' stitchless tennis ball has been adopted for exclusive use for a large number of official tournaments throughout Canada.

Aviation

Commercial Airship to Be Built by the Goodyear-Zeppelin Corp.

C. B. Ault, manager of aeronautical sales, confirms the report of the order given by a private syndicate in New England States of an airship of the "Volunteer" type, the first to be built by the Goodyear-Zeppelin Corp., of Akron, O., for commercial interests. It is to be delivered on or before May 1, 1930. The syndicate is headed by Arthur G. Wadsworth, Dartmouth, Mass. The ship will be 128 by 37 feet, twin-motored, have a helium capacity of 86,000 cubic feet, and carry four including the pilot.

The training of pilots at the Los Angeles Goodyear plant has become a lively little industry, every flying hour being engaged, and Karl Lange, chief of the instruction staff, reports that many hundred young men are on the waiting list. Cooperating with Lieut. Lange is Ward T. Van Orman, winner of many national and international balloon contests, who is director of the Goodyear-Zeppelin ground school at Akron, O.

The A. O. Smith Corp., Milwaukee, Wis., has been awarded the contract for the storing of helium gas for dirigibles used by the Goodyear-Zeppelin Corp., Akron, O. The requirement will be at least 1,000,000 cubic feet, which is the approximate volume of one cell of the new ships being built by Goodyear for the United States Navy.

Knut Eckener, son of Dr. Hugo Eckener, commander of the Graf-Zeppelin, will soon arrive in Akron, O., to become associated with the Goodyear-Zeppelin Corp.

W. O'Neil, president of the General Tire & Rubber Co., Akron, O., in calling upon President Hoover recently, with the pilots of the "Sky Fleet" of the General tire company, at the invitation of the President, said in an interview at the White House that the present outlook for the American rubber industry is excellent.

"While margins in the rubber industry have been close this year, there is no imminent inventory loss on either rubber or cotton stocks," Mr. O'Neil declared.

"Cotton now held has been purchased at prices below the present market and the same is true of rubber stocks.

"Expansion of the aviation industry means the development of a huge potential market for airplane tires, three sets of which are worn out in one year while an automobile uses a set of tires two years."

Henry J. Brown, flying in the flagship of the "Sky Fleet," specially built and equipped for the General Tire & Rubber Co., Akron, O., won the 1929 National Air Races, arriving at the Cleveland airport 13 hours 15 minutes and 7 seconds after he had left Los Angeles, Calif. By winning this transcontinental non-stop race, Lieut. Brown set a new record for this trip, won perpetual possession of a beautiful silver and bronze trophy and $5,000 in prize money.

Ford Reliability Tour. Fifty airplanes representing many of the largest and best-known airplane manufacturers will compete for the Edsel B. Ford trophy, in the Ford Reliability Tour, beginning at Detroit, Mich., on October 5. The tour will end at Detroit on October 21, after having touched thirty-two cities in nineteen different states. Such famous pilots as Amelia Earhart, George C. Haldeman, Dales C. Jackson, Forest O'Brine, Captain Frank Hawkes, and Lee Schoenhair will pilot planes either as regular entrants or in semi-official capacity. Lee Schoenhair will pilot the famous plane "Miss Silvertown," of The B. F. Goodrich Co., Akron, O.

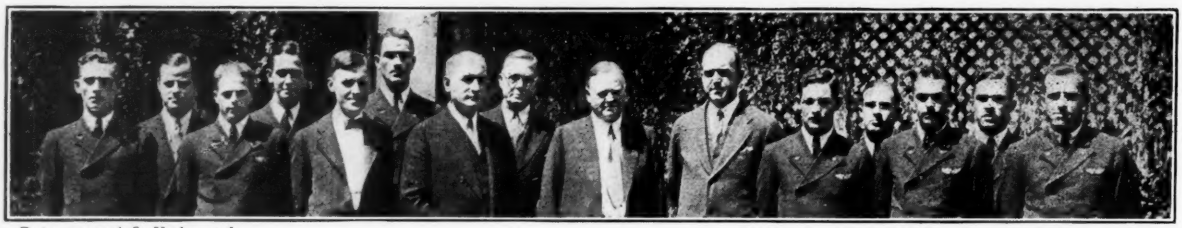
Graf Brings Crude Rubber across Pacific

In its flight across the Pacific Ocean from Tokyo to Los Angeles the Graf-Zeppelin carried two small bales of crude rubber consigned from the Goodyear plantations in Sumatra to the company's factories in Los Angeles and Akron. The rubber was received in California 70 hours after being shipped from the Japanese port.

Having delivered the rubber to President John W. Mapel and Vice President E. J. Thomas, Capt. von Schiller, of the Graf-Zeppelin, asked if he might ride in what alongside of the great airship seemed but a baby blimp, the Goodyear airship "Volunteer." Not only he but Knut Eckener, son of the Graf's commander, Captains Lehman and Fleming, and several of the world-circling airship's crew also enjoyed trips in the Goodyear ship.

Lieut. Karl Lange, skipper of the "Volunteer," and eight young student pilots now training on the Goodyear airship, assisted in servicing the Graf at the Municipal Airport and won much praise from the German airmen.

Dr. Hugo Eckener, commander of the Graf-Zeppelin, before his return to Europe was a guest in Akron, O., of Paul W. Litchfield, president of The Goodyear Tire & Rubber Co. They participated also in conference with banking interests at which it was purported that formation of airship lines crossing the two oceans was discussed.



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President Herbert Hoover is shown in the above picture on the lawn of the White House grounds in Washington just after he had officially greeted the pilots of the "Sky Fleet" and officials of the General Tire & Rubber Co. In the front row, left to right are: Eric E. Seward, motor expert; Lieut. Sheldon B. Yoder; H. S. Hoover, codirector of the "Sky Fleet" tour; W. O'Neil, president of the General Tire & Rubber Co.; President Herbert Hoover; Wm. P. MacCracken, Assistant Secretary of Commerce for Aviation; Lieut. A. C. Lybarger, fleet commander; Lieut. J. S. B. Harvey; and Lieut. Murl Estes. In the rear row, left to right are: Frank Hoffman, flight engineer; Lieut. Horace J. Reid; Lieut. Robert K. Black; P. H. Hart, vice president of the General Investment Co.; Lieut Robert K. Giovannoli, fleet technician; and Lieut. Alfred Kalberer.

The Rubber Industry in Europe

GREAT BRITAIN

Safeguarding the British Tire Industry

The tire manufacturing industry is greatly benefited by safeguarding, says Colin Macbeth in a recent issue of the London *Rubber Age,* in answer to the query, "How is 'Safeguarding' Affecting the British Tire Manufacturing Industry?" Not only the tire industry benefits, but also the allied industries.

A rough estimate of the present weekly output of automobile tires in England is 100,000 tires against 60,000 before the import tax was levied. That is to say, almost 100 per cent of British requirements are now made in England instead of only 60 per cent. This does not take into account tires imported with chassis.

Where Great Britain Gains

The country gains because each new tire factory operating in England must use mainly British labor, British coal or power, British materials, transport facilities, and technical help. A fair estimate puts the number of operatives already employed in new factories at 4,000, to which must be added those in transportation, cotton, and steel industries, and in the importation of raw rubber. A conservative estimate covering the latter groups would reach 3,000, or a total of 7,000 workers previously unemployed. If the average number of dependents on each operative is two, then the total number of those provided for owing to safeguarding the industry must be 21,000.

Increased Competition for English Manufacturers

When the duty on tires was first imposed, the British tire manufacturer was at a great advantage as his tires were burdened neither with overseas charges nor taxes; whereas the foreign manufacturer selling to England had to do so at a loss or start to manufacture in England. This, of course, has happened in the meantime, and all those foreign firms that were formerly well-established here now have their own factories in England and have carried competition right into the country. Their advantage is that their factories are the most up-to-date, and the majority are using the most up-to-date methods. The number of British tire manufacturers able to meet such competition, is limited. Some realize this and are improving their plants. Of course these need not fear competition provided they maintain a high standard.

Mr. Macbeth suggests that the newcomers may indulge in price-cutting, which, if not stopped by general agreement, will cause the industry to suffer. All in all, however, he sees good in competition, for it has stirred the British manufacturer to meet the situation.

Effect on Allied Industries

First and foremost is the cotton spinning industry, which now must supply a greatly increased demand for Egyptian cotton products for the tire industry, products previously spun abroad.

Then there is the manufacture of rubber machinery. At first the newcomers ordered necessary new equipment from abroad, but many now patronize British companies. However, British firms are not yet able to meet all these demands, and must become more skilled in these particular requirements before they can expect to get their full share of tire machinery orders.

The increased output of tires demands an increased use of raw rubber, and Mr. Macbeth considers that imports for use in Great Britain must now be nearing double the tonnage of pretax days.

Summing up, the writer states that the British manufacturer, provided his business is run on sound lines, need not fear this new competition. But those firms that previously made tires as a side-line without much thought of quality or service will not last much longer, for tire manufacturing has now become a business in England and not a gold mine.

The Shoe and Leather Fair

The Shoe and Leather Fair, 1929, will again be held at the Agricultural Hall, Islington, from October 7-11, inclusive. Details available show that great as the interest of the industries concerned has been on previous occasions, they are outdoing themselves this time in both the number of participants and the variety of exhibits. Rubber footwear will occupy a most prominent position, and about thirty-two firms will have exhibits. The English branches or distributers of several foreign firms are likewise participating, including the Hood Rubber Co., featuring among other goods the Hood gaiter boot, flexible and graceful in shape and lined with white fleece; Etablissements Hutchinson, showing some very shapely and attractive wellingtons, snow-boots, footholds, etc.; Tretorn concern of Sweden; the Vereingte Gummiwaren-Fabriken, Wimpassing, Vienna, Austria, with a complete collection of their "Fairylite" bathing shoes and super-wellingtons, galoshes, etc.; the Miner Rubber Co., Canada, represented by F. G. Wigley & Co., Ltd., presenting heavy rubber boots for men, and novelty and utility footwear for women, girls, and children.

The Avon India Rubber Co., Ltd., is including in its collection Avon Vo-La-Crepe, a scientifically treated material with the natural qualities of crepe rubber, but free from its disadvantages. It is claimed that Vo-La-Crepe is buoyant and flexible, cool to the feet, and non-slipping, and in no way distorts the shoe. It can be channeled and worked like leather and finished with a permanent clean-cut edge.

The Kaufman Rubber Co., Ltd., Kitchener, Canada, introduces a new feature in its rubber wellingtons, that is, a two-inch Louis heel of solid rubber instead of wood. The new heel is perfectly rigid, though at the same time slightly resilient for comfort.

The exhibit of the Rubber Growers' Association will be divided into two sections, the first showing crepe-soled footwear of every description, and the latter demonstrating the latest methods of repairing crepe-soled footwear, including the use of liquid latex. A new booklet has been specially prepared for repairers, and the various methods described will be demonstrated at the Fair.

Other exhibitors include Dela Rubber Co., Ltd., Liverpool; Dominion Rubber Co., Ltd., London; Gutta Percha & Rubber (London), Ltd.; I. T. S. Rubber Co., Ltd., Petersfield, Hants; North British Rubber Co., Ltd., Edinburgh; Palatine Branch of the Leyland & Birmingham Rubber Co., Ltd., Preston; Phillips Patents, Ltd., London; Redfern's Rubber Works, Ltd., Hyde, Cheshire; Rubber Industries, Ltd., London; and Waverley Rubber Co., Ltd., Edinburgh.

Institution of the Rubber Industry

The first meeting of the 1929-30 session of the Institute of the Rubber Industry was held at the Grand Hotel Birmingham on September 5, 1929. A lecture, "The Trend of Pneumatic Tire Design in Relation to Modern Motor Cars," was delivered by Mr. Shively, manager of the Tire Design Division of The Goodyear Tire & Rubber Co., Akron, O., U. S. A.

Millionth British Goodyear Tire

On July 31 the Mayor of Wolverhampton started the machinery that produced the millionth tire at the Goodyear works at Wolverhampton. Some 1,350 British employes now work in three eight-hour shifts, and 3,000 pneumatic tires and tubes, besides about 2,400 pounds of tire accessories are produced daily.

Since the company started operations in England, about 6,000 tons of rubber have been brought from the London docks, and 2,400 tons of Goodyear's Supertwist fabric have been brought from Lancashire, where approximately 1,000 mill hands are employed in its production. The fuel consumption has been 17,000 tons of coal, most of it supplied by the Staffordshire collieries.

Rubber Lectures and Courses

The Northern Polytechnic, Holloway, London, in its 1929-30 prospectus gives particulars regarding the courses offered in the Department of Chemistry and Rubber Technology, of which Dr. T. J. Drakeley is the head.

Day and evening courses are offered in technical chemistry, pure chemistry, and rubber technology. The department has three lecture rooms and eight well-equipped laboratories, in addition to a reference library, photographic dark room, etc.

A series of sixteen lectures on rubber will be given on consecutive Tuesdays at the City of London College under the auspices of the Department of Commercial Products. The first of ten lectures by George Rae, of Harrisons & Crosfield, Ltd., entitled "A Survey of Rubber Production and Consumption," was given on September 24. C. Kraay, of Hymans Kraay & Co., will give two lectures on "The Marketing of Rubber," and Dr. H. B. Stevens will lecture on "The Character, Grades, Defects of Raw Rubber" on the last four Tuesdays.

The fee for the entire course is 17 shillings 6 pence, and at the end of the course an examination will be held, the best student to receive a prize of five guineas offered jointly by the Rubber Trade Association of London and the Rubber Growers' Association.

GERMANY

Statistics Relating to Imports and Exports

Germany's crude rubber imports during the first half of 1929 again showed an increase, as had been expected. The figures were 291,394 quintals, value 57,717,000 marks, against 201,269 quintals, value 63,374,000 marks, during the first half of 1928. When reexports have been deducted, the net figures are 273,223 quintals, instead of 189,040 quintals. At the same time it must be pointed out that imports of waste and old rubber dropped more than half as compared with the year before, while exports were more than double, the figures under the respective heads having been 23,849 quintals instead of 51,154 quintals, and 24,019 quintals instead of 11,224 quintals.

The trade in rubber manufactures did not work out entirely in Germany's favor in the period under review, exports totaling 111,435 quintals, value 64,682,000 marks, in the 1929 period, against 90,859 quintals, value 56,763,000 marks, in 1928, and imports totaling 45,015 quintals, value 22,271,000 marks, instead of 35,019 quintals, value 18,811,000 marks. It will be noted that the imports of manufactured goods increased more rapidly than the exports.

The following imports in quintals included tubes for motor vehicles, 153,691 against 101,936; bicycle tubes, 189,976, instead of 125,852; automobile tire covers, 201,042 against 170,563; bicycle tire covers, 232,365 against 281,418; footwear, 953 against 135; rubber thread, 1,671 against 1,311.

The chief exports in quintals were: automobile tires, 134,796 against 68,866; bicycle tires, 681,505 against 605,032; tubes for motor vehicles 121,876 against 67,491; tubes for bicycles, 1,342,113 against 1,721,578; footwear, 1,858 against 888; belting, 2,565 against 2,302; hose, 10,224 against 8,767; packing, 1,862 instead of 1,573; hard rubber and hard rubber manufactures, 6,159 against 5,258. It will be noted that all the exports show increases with the exception of tubes for bicycles, which fell off considerably during the six months under consideration.

New Goods

The latest rubber novelty produced by M. Steinberg, Cologne-Braunsfeld, is a rubber fan, which has recently been patented. The fan is made entirely of rubber and therefore can not only be folded in the usual manner but, because of its flexibility, can be made to take up as little space as possible. Of course it can readily be cleaned with a damp cloth and may be flirted with impunity in the water at the seaside resorts. The fan is made in plain colors, or marbleized, printed, painted, or decorated with beads.

Rubber wall coverings have hitherto been made of sheets of rubber 2 to 4 mm. thick, in solid colors and with plain or grained surface to imitate leather. The disadvantages of this type of covering are that it is expensive and difficult to hang, as owing to its thickness it does not readily conform to the surface of the wall. A new type of rubber wall covering has now been patented by the Thuringer Schlauchweberei und Gummiwerk, Waltershausen, Thuringia, which is only 0.2 to 0.4 mm. thick, that is about as thick as the usual kind of wall paper. These thin rubber strips are claimed to be easy to hang, are washable, and come in various colored patterns. The designs are applied in the usual manner with the aid of the calender.

Company Notes

The Vulkan Gummiwarenfabrik Weiss & Baessler, A. G., Leipzig, reports that the fiscal year ended June 30, 1929, has been excellent; so a dividend of 10 per cent will be declared. The present situation is described as most satisfactory. The Grossenhain works of the firm were for the most part destroyed by fire in the beginning of the year, and it has not yet been possible to resume work to capacity there. However, the concern had just previously acquired a rubber factory in Erfurt, and the greater part of the Grossenhain operations were transferred to the new factory.

Kabelwerk Rheydt, A. G., Rheydt, will declare a dividend of 12 per cent as a result of the past year's working. Business was good and on the whole continues so at the present time. The financial condition is sound, but at the same time there is to be no increase in the amount of dividends distributed.

Concentrated Latex

In 1926 the Metallgesellschaft A. G. had patented a process for concentrating latex as it flowed from the tree. At the time and in connection with this process the Kautschuk G.m.b.H. had been founded in Frankfurt a.Main. This has now become a manufacturing company, and the Darex A.G. has recently been registered with a capital of 500,000 marks. The concern, which will erect a factory in Frankfurt a.Main, will produce and sell manufactured and partly finished rubber goods, and such articles or partly finished goods as make use of rubber.

The board of directors include both directors of the Metallgesellschaft, Drs. Alfred Merton and Alfred Petersen, Professor Ernst Hauser, and Bradley Dewey, president of the Dewey & Almy Chemical Co., Cambridge, Mass., U. S. A. The American company is stated to have worked successfully with the processes of the Metallgesellschaft in its own factories, and is understood to be taking over half of the capital of the newly founded firm at Frankfurt a.Main.

BELGIUM

The value of Belgium's exports of manufactured rubber goods during 1928 showed an increase of 49 per cent compared with the previous year. The increase in value of imports was only 4 per cent. Tires are the main articles both of export and of import. While Belgium bought 2,879,600 kilos of tires, value 96,300,000 francs, in 1928, she exported during the same year 6,259,800 kilos, value 260,914,000 francs. Footwear imports at the same time were 414,700 kilos, value 13,257,000 francs, against exports, 465,700 kilos, value 9,148,000 francs, and imports of rubber goods for industrial purposes were 595,400 kilos, value 20,859,000 francs, against exports of 450,800 kilos, value 12,333,000 francs. The total amounts imported and exported during the year came to 5,289,800 kilos, value 199,559,000 francs, and 8,331,500 kilos, value 312,074,000 francs.

A review of figures for exports and imports since 1925 prove that while the former increased rapidly from year to year, the latter fluctuated and in 1928 were actually below those of 1925 as shown herewith.

	Imports Kilos	Exports Kilos
1925	6,008,644	2,976,059
1926	4,804,440	3,668,282
1927	4,657,300	5,572,700
1928	5,289,800	8,331,500

The Rubber Industry in the Far East

MALAYA

Effect of Floods

The annual report of the Rubber Research Institute of Malaya for 1928 by Dr. G. Bryce has just been published in booklet form and covers the history of the Institute, its scope and organization, finance and general survey of research work in the Empire. Perhaps one of the most interesting sections of this report is that dealing with the effect of the 1926-1927 flood on rubber estates in Malaya.

Contrary to expectation, no marked increase in disease or attacks from pests have been reported as resulting from the flood. Actually most of the damage was caused by windstorms on the flooded areas, over 27,400 trees being blown down. Most of the trees were on one estate, where the storm seems to have been particularly severe. In addition 3,500 trees were reported damaged by winds. In certain districts a great amount of silt was deposited, the depth varying from a couple of inches to as much as 16 feet in Kuantan.

In a number of cases there was a marked increase in yields from the flooded areas, as shown by detailed figures. Seven estates recorded an increase of between 20 and 40 per cent in the yield of latex from flooded fields. Four other estates report a similar experience. When trees were tapped, after having been submerged, the latex after each tapping continued to flow for hours into the afternoon or even well into the night. The increased flow was maintained for three weeks or a month during which period it gradually returned to normal. One estate reported a low rubber content during this period. Another estate reported that following the heavy flow of latex, the trees frequently developed brown bast. The majority of estates, however, reported no change in yields after the flood.

Rubber Statistics

On the cessation of restriction it was suggested to the Federated Malay States Government that it would be a pity to allow the large amount of information collected by the Central Assessment Committee to be lost. Consequently it was decided to retain J. Gordon Carrie for the purpose of abstracting and collating the more important information to be found in the papers of the Assessment Committee. The work of Mr. Carrie and his staff has now been published.

The total acreage under rubber in the Federated Malay States in 1928 was 1,433,056 as compared with 1,237,989 in 1922. The distribution in 1928 was as follows: Perak, 511,228 acres; Selangor, 476,934 acres; Negri Sembilan, 325,348 acres; and Pahang, 119,546 acres.

The acreage on estates of 100 acres and over was 898,119, of which about 15 per cent was Asiatic owned.

Practically all the holdings of under 100 acres is Asiatic owned. At the end of 1916 these small holdings represented 36.3 per cent of the total planted acreage. By the end of 1922 this had risen to 38 per cent, only to drop to 37 per cent by the end of 1928. If to the small holdings are added the larger Asiatic-owned estates, it will readily be seen that nearly half the total planted area in the Federated Malay States is owned by Asiatics.

The six years 1923 to 1928 show an increase in the planted area of 195,067 acres, or 15.5 per cent, as against an increase of 447,504 acres, or over 56 per cent, in the previous six years, 1917-1922.

Crop Yields

The crop statistics were compiled from statements giving the monthly crop and the average area tapped during the month. Even on estates where a periodic system of tapping was not in force, the actual fields in tapping were constantly being changed and in consequence the average area tapped does not truly represent the area from which the crop was obtained. In addition it has to be remembered that these crops were obtained after four and five years of restriction and it is necessary to reduce them considerably before they can be regarded as indicative of future yield.

Periodic systems of tapping were somewhat more in vogue in 1928 than in 1927, and this possibly explains the apparently higher yield per acre despite the decrease in the percentage of the area nominally rested. It is interesting to note that the relative yield per acre for the various states is very similar for the two years, with Perak an easy first on both occasions. The average yield per acre in the Federated Malay States in 1927 was 420 pounds, the figure for Perak being 440 pounds, for Selangor 415 pounds, for Negri Sembilan 409, and Pahang 407.

In 1928 the average yield per acre was 436 pounds, the figures for the states having been as follows: Perak, 456 pounds; Selangor, 431; Negri Sembilan, 415; and Pahang, 429.

The monthly production of estates showed a steady increase from 9,176 tons in June, 1928, to 11,415 tons in May of the present year.

Rubber Research Inquiry

The special inquiry conducted by the Board of the Rubber Research Institute in regard to allegations of an unsatisfactory state of affairs prevailing in the Institute as well as into what is termed the Ashplant controversy may now be regarded as at an end. The opinion of the board as to the desirability of renewing Dr. Bryce's agreement was divided. However, the majority was against it, and consequently Dr. Bryce's services will not be reengaged.

Rubber Imports

According to official returns the imports of raw rubber into Singapore and Penang during the first six months of the present year totaled 81,422 tons. Of this, 67,938 tons, or 84 per cent of the whole, came from the Netherlands East Indies; 6,822 tons from Sarawak and British North Borneo; 6,662 tons from Indo-China, China, Siam, Burma, and other sources.

Of the imports from the Dutch colonies, the bulk, or 43,976 tons, came from Sumatra, 22,006 from Borneo, 916 tons from Java, and 1,040 from other Dutch islands. Imports from the Netherlands East Indies during the first half of the year 1928 were: Sumatra, 44,688 tons; Borneo, 18,827 tons; Java, 792 tons; other Dutch islands, 792 tons.

NETHERLANDS EAST INDIES

Coolie Attacks

Feeling is running high in planting circles in the Dutch East Indies as a result of the recent succession of attacks on European assistants by estate coolies. There have been protest meetings; the wives of planters have appealed to the Queen of Holland; and the matter has been widely discussed in the press. Certainly the matter is serious enough, for, needless to say, the state of mind that causes the coolies to make these attacks constitutes a menace to the further development of the less populated districts of the Dutch East Indies.

In the opinion of the majority of the planters, the trouble lies with the present government, which it is claimed has adopted an unduly lax and sentimental attitude toward the coolie question. On the other hand, most of those not directly connected with the plantation industry are apt to look for the cause of the trouble in the so-called penal sanction and the indenture system. In Malaya, where labor is free and has been so for some years, attacks on assistants are of rare occurrence. In defense of the Dutch planting community this much

may be said, that the Javanese or Sundanese coolie is an entirely different type from the Tamil coolie employed on the Malayan estates. In this latest attack, however, the cause seems to have been the existence of corrupt conditions on the estate. There seems to be some basis for the rumor in the fact that the manager has been recalled and it is claimed has been summarily dismissed.

Rubber in Sumatra

The Commercial Association of Medan and the A. V. R. O. S. (Rubber Planters' Association, East Coast Sumatra) have published statistics regarding the extent and output of various crops in East Coast Sumatra, Atjeh, and Tapanoeli, as of December 31, 1928. With regard to rubber, the area in East Coast Sumatra was 215,260 hectares. The area under production was 147,425 hectares, and the 1928 output, 62,455,666 kilos. The estimated 1929 output is 47,291,179 kilos.

The planted area in Atjeh and Dependencies was 24,936 hectares, the area under production, 14,374 hectares, and the output in 1928, 5,240,709 kilos. The estimated 1929 output is 5,120,569 kilos.

In Tapanoeli the area under rubber was 8,813 hectares, the mature area being 5,488 hectares, while the output was 2,381,204 kilos. The output for 1929 is estimated at 846,000 kilos.

The 1928 report of the East Coast Sumatra Institute includes the following interesting table concerning rubber production in East Coast of Sumatra, arranged according to the share of the various nationalities active in this district:

	1927 Tons	Per Cent	1928 Tons	Per Cent
Dutch	18.846	34	19,309	35
British	15.885	29	15.833	28
American	13,059	24	13,395	24
Franco-Belgian	4,819	9	4,684	8
Others	2,487	4	2,649	5
Total	55,096	100	55,870	100

In 1925 the outputs of both Dutch and British estates came to 31 per cent of the total production; the above percentages, 35 per cent for the Dutch and 28 per cent for the British, shows an improvement for the former.

Company News

The Netherlands Rubber Union held its annual general meeting on August 28. The chairman announced in the course of his report that since the report had been framed, the company was meeting with unusual difficulties in Djambi in connection with the purchase of rubber from the natives, owing to the new regulations enforced to prevent adulteration of the rubber by the natives.

The difficulties mentioned are greatly hampering activities and interfering with the program of work. It would seem that the prediction made by an experienced Dutch business man at the time the union was formed, that it would find its greatest difficulty the task of negotiating with the natives for rubber is practically coming true.

The Netherlands Gutta Percha Co. It was unanimously resolved at the annual meeting to liquidate the firm, the condition of which had been pronounced hopeless several years ago. Experts made a thorough study of the whole business and came to the conclusion that it would never be able to meet competition unless it could be reorganized in such a way that a part of the indebtedness would be cancelled.

New Rubber Product

A new rubber product has been recently patented by the Netherlands Gutta Percha Co., consisting of a layer of vulcanized rubber and a layer of non-vulcanizable rubber. It is claimed for this material that it can easily be united with leather or other substance by means of an adhesive.

One of the chief aims of this patent is to obtain a vulcanized crepe rubber sole (with as little admixture as possible), or an artificial leather that can be combined with leather by way of the unvulcanized rubber side and with the help of the usual gumming materials, thus securing a firm union of the vulcanized rubber with the leather.

This material could also be used for floor tiling or mats, or in general for such vulcanized rubber articles as have to be united to another material, for instance wood.

SIAM

The Bangkok correspondent of the *Straits Times* gives some interesting figures and data regarding the rubber industry in Siam. This country has exported small quantities of jungle rubber from the *Ficus elastica* and other rubber-producing plants for many years, but in recent years there has been a very rapid increase in the quantity of Hevea produced. This is amply illustrated in the following table, which, unfortunately, only gives the values of the exports and not the actual amounts in tons. The values are given in ticals, as mentioned in the official customs returns, but as there is no export duty on rubber, there seems to be a possibility that the values are somewhat underestimated. A tical equals 50 cents. The figures were as follows:

Fiscal Year	Ticals
1920-21	428,229
1921-22	201,446
1922-23	697,451
1923-24	1,879,222
1924-25	3,419,619
1925-26	9,335,045
1926-27	5,213,741
1927-28	5,272,597
1928-29	6,365,802

Most of this output comes from the provinces of Puket, Nakon, Srithamarat, and Pattani, but some is from the eastern side of the Gulf of Siam, and there are some very large areas which are now coming into bearing. The interesting fact is that rubber now occupies fourth place in Siam's list of exports and there is every sign that there will be a considerable increase in output in the near future.

It is stated that an expert who recently visited some of the plantations in the Chantaboon area found that the trees were extraordinarily virile and healthy there and though many of them had not as yet reached the tappable stage, they gave every indication of proving a very successful investment, since labor is both cheap and abundant, and taxes very light, while the absence of any export tax must be considered a further advantage.

JAPAN

Figures compiled by the Imperial Ministry for Industry and Trade, show that the imports of crude rubber into Japan have increased from 19,000 tons in 1926 to 20,800 tons in 1927 and 25,600 tons in 1928. Japan is now sixth on the list of rubber consuming countries, her share in the consumption of crude rubber in 1928 coming to 3.9 per cent.

In 1927 there were 531 rubber factories, which is 33 more than in the preceding year. The distribution of these factories was as follows: 187 in the Tokyo district, 146 in Hogyo, 88 in Osaka, 14 in Okayama, and 96 in other parts of the country.

Japan manufactures chiefly rubber soles and footwear. The production of various types of tires is next in importance. In 1928 the total output of the Japanese rubber industry represented a value of not less than 90,000,000 yen. A yen equals .498 of a dollar. There has been a steady growth in exports, the total value rising from 7,082,000 yen in 1926 to 7,439,000 yen in 1927 and 12,729,000 yen in 1928. Rubber footwear was featured in Japan's export trade accounts for the first time in 1928 when the value was 3,883,000 yen. The value of tires exported during that year was 5,725,000 yen, of rubber toys, 1,934,000 yen, and of other rubber goods, 1,187,000 yen. China and the East Indies are the principal markets for Japanese tires, while the toys go chiefly to America, England, and Australia.

There are rumors afloat that a group of Japanese business men intend to erect a tire factory and will open rubber plantations in Malaya and Borneo in order to be provided with the necessary raw material.

Molina's Rubber Smoking Machine

Enrique Molina calls attention to the misspelling of his name on page 160 in the "Rubber Country of the Amazon", published in 1911 by Henry C. Pearson. The proper spelling is as above. Incidentally it is pleasant to recall the latex smoking machine that was the result of practical experiments in the rubber forests of Amazonia. The fact that plantation rubber practically supplanted the wild product kept a very valuable machine from being generally adopted throughout South America.

Indo-China Exports

Indo-China exported 9,880,936 kilos of crude rubber during 1928, of which 6,171,970 kilos went to France and 3,702,166 kilos to Singapore. The small balance was divided between Hongkong and Japan.

Rubber Patents, Trade Marks and Designs

Machinery

United States

1,723,501.* Weftless Cord Fabric. This device is adapted for use with a standard four-roll calender of the type having the top roll offset, but it is not restricted to use on calenders of this type. M. Castricum, Springfield, assignor to The Fisk Rubber Co., Chicopee Falls, both in Mass.

1,723,565.* Tire Band Builder. This apparatus is especially designed to facilitate the building of casings of the type having inextensible beads, the tire being first constructed in band form and later expanded to shape. T. P. Little, and W. F. Irrgang, assignors to The Fisk Rubber Co., all of Chicopee Falls, Mass.

1,723,571.* Inner Tube Former. This invention provides a means for forming annular inner tubes automatically from a flat band of stock. G. L. Mather, Milwaukee, Wis., assignor to The Fisk Rubber Co., Chicopee Falls, Mass.

1,723,968.* Tire Casing Machine. This is designed to build a number of casings at a single operation by automatically winding layers of cord fabric spirally about suitable mandrels of any convenient length. The machine cooperates and coordinates with suitable apparatus for rubberizing the fabric preparatory to the winding operation. H. A. Denmire, assignor to The General Tire & Rubber Co., both of Akron, O.

1,724,348.* Sheet Fabric Cutter. This device for cutting sheet material into strips comprises a knife-holder, which may be brought into engagement or released without interrupting the operation of the other knives. The flexibility of the device not only minimizes the salvage but produces an exact width of fabric having a smoothly cut edge. W. R. Gerstenslager, assignor to The Goodyear Tire & Rubber Co., both of Akron, O.

1,724,354.* Inner Tube Machine. A primary object of this invention is to provide an efficient method of making and skiving tubes, which obviates the necessity of rolling the stock on poles preparatory to vulcanization. By the method and apparatus employed for constructing inner tubes for tires the sections of extruded material are secured within hollow mandrels and are vulcanized in that condition. H. T. Kraft, assignor to The Goodyear Tire & Rubber Co., both of Akron, O.

1,724,877.* Bias Cutter Wind-up. This invention is of particular utility in factories engaged in the manufacture of automobile tires, and is especially designed for use in conjunction with the vertical type of bias cutter. R. Iredell and I. J. Remark, assignors to The General Tire & Rubber Co., all of Akron, O.

1,724,967.* Strainer Head for Tubing Machines. This is designed to operate during the process of reclaiming, upon rubber compounds that include substances of various consistencies. The invention provides a strong and effective strainer head which may rapidly and accurately be assembled and disassembled, adjusted to proper position, and rendered proof against serious injury from undue strain. V. Royle, Paterson, N. J.

1,724,974.* Jacketed Heater. By the present invention a jacketed heater is produced wherein the two shells can expand and contract with perfect freedom independently of each other, although capable of withstanding the external and internal pressures exerted when the heater is in use. F. G. Sherbondy, assignor to The Biggs Boiler Works Co., both of Akron, O.

1,726,497.* Tire Building Machine. This invention relates to an apparatus for fabricating a continuous composite web of material adapted for use in the manufacture of tire carcasses. H. I. Morris, Lakewood, assignor to The Cord Tire Machine Co., Cleveland, both in O.

1,723,336. Treating Material Apparatus. H. M. Eaton, Lynn, assignor, by mesne assignments, to N. Edmunds, Swampscott, both in Mass.

1,723,386. Collapsible Core. H. D. Stevens, assignor to The Firestone Tire & Rubber Co., both of Akron, O.

1,723,387. Tire Building Machine. W. C. Stevens, assignor to The Firestone Tire & Rubber Co., both of Akron, O.

1,723,404. Extensometer Mounting. R. W. Brown, assignor to The Firestone Tire & Rubber Co., both of Akron, O.

1,723,522. Sole Attaching Machine. F. H. and H. S. Pochin, and G. H. Dove, Leicester, England.

1,723,562 and 1,723,563. Pneumatic Tire Casing. P. W. Lehman, Milwaukee, Wis., assignor to The Fisk Rubber Co., Chicopee Falls, Mass.

1,723,572. Expanding Tire Casings. T. Midgley, Hampden, assignor to The Fisk Rubber Co., Chicopee Falls, both in Mass.

1,724,208. Selvage Edge Trimmer. A. P. Lewis, assignor to The Miller Rubber Co., both of Akron, O.

1,724,330. Bias-Cutter Safety Appliance. L. Wetmore, Alameda, Calif., assignor to The Goodyear Tire & Rubber Co., Akron, O.

1,724,358. Slug Cutting Machine. V. V. Messer, Douglaston, N. Y., assignor to The Goodyear Tire & Rubber Co., Akron, O.

1,724,664. Tire Casing Support. De F. Kellogg, Los Angeles, Calif.

1,725,287. Die Press. C. T. Lyons and H. W. Bell, assignors to The Durable Mat Co., all of Seattle, Wash.

1,726,099. Covered Elastic Strands. L. B. Chisholm, Stoneham, assignor to Everlastik, Inc., Chelsea, both in Mass.

1,726,219. Rubber Sheet Perforator. J. R. Gammeter, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.

1,726,359. Applying Material to Cores. C. Martell, Cicero, and B. A. Hagen, Chicago, both in Ill., assignors to Western Electric Co., Inc., New York, N. Y.

1,726,382. Lasting Jack. L. H. Burnham, Lexington, and A. Drechsler, Watertown, assignors to Hood Rubber Co., Watertown, all in Mass.

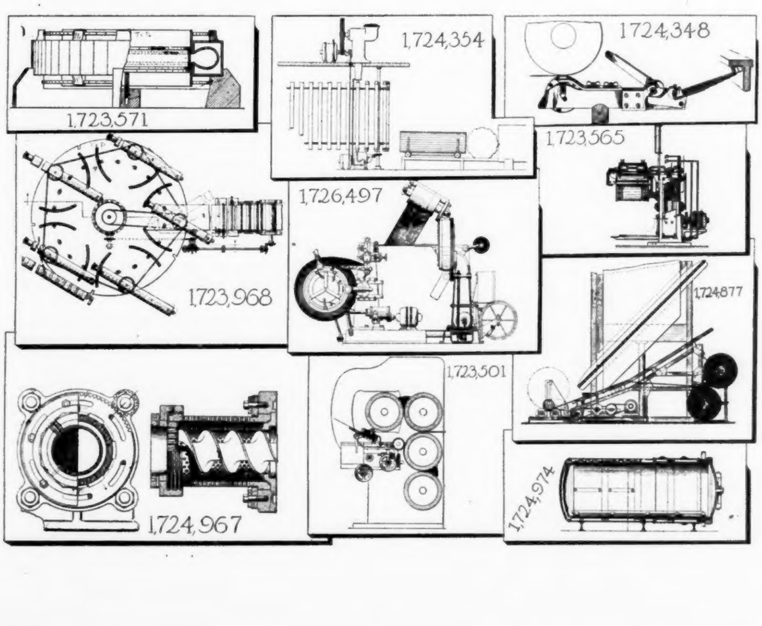
Dominion of Canada

291,887. Fabric Drier. A. Lambrette, Geo. (Dolhain), Belgium.

291,965. Tire Mold. The Goodyear Tire & Rubber Co., assignee of H. A. Brittain, both of Akron, O., U. S. A.

291,966. Collapsible Tire Building Core. The Goodyear Tire & Rubber Co., assignee of E. G. Templeton, both of Akron, O., U. S. A.

291,970. Tire Machine. The Goodyear



* Pictured in group illustration.

Tire & Rubber Co., assignee of R. W. Snyder, both of Akron, O., U. S. A.

291,977. REPAIR TOOL. The Goodyear Tire & Rubber Co., assignee of B. C. Eberhard, both of Akron, O., U. S. A.

291,978. TIRE TESTING MACHINE. The Goodyear Tire & Rubber Co., assignee of H. T. Kraft, both of Akron, O., U. S. A.

291,979. SHEET FEEDER CONTROL DEVICE. The Goodyear Tire & Rubber Co., assignee of J. I. Haase, both of Akron, O., U. S. A.

291,980. TESTING MACHINE. The Goodyear Tire & Rubber Co., assignee of M. L. Kochheiser and S. A. Steere, all of Akron, O., U. S. A.

292,297. VULCANIZING METHOD. L. A. Laursen, Akron, O., U. S. A.

292,367. CONDUCTOR COMPACTING DEVICE. The Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of T. B. Huestis, Bristol, R. I., U. S. A.

United Kingdom

312,207. JOINT-MAKING PACKING. G. H. Cook, Lion Works, Woking, Surrey.

312,257. MAKING INNER TUBES. Dunlop Rubber Co., Ltd., 32 Osnaburgh St., London, E. A. Murphy, and D. F. Twiss, Fort Dunlop, Birmingham.

312,266.† TIRE MAKING MACHINE. Goodyear Tire & Rubber Co., 1144 E. Market St., assignee of W. H. Campbell, 312 Glenwood Ave., both of Akron, O., U. S. A.

312,274.† TIRE VULCANIZING MOLD. A. V. E. Gronberg, 19 Baltzarsgatan, Malmo, Sweden.

312,449. THREAD WINDING MACHINE. Dunlop Rubber Co., Ltd., 32 Osnaburgh St., London, and T. Cropper, Fort Dunlop, Birmingham.

312,451. MAKING DUMMY SWEETMEATS. T. and W. Errington, 7 Cottage Grove, Portsmouth.

312,594. GAS MASK MACHINE. F. C. Jones, of Reliance Rubberware, Formosa St., Paddington, London.

313,102. TIRE MOLD AND VULCANIZER. Dunlop Rubber Co., Ltd., 32 Osnaburgh St., London, H. Willshaw, H. Smith, and F. G. Broadbent, Fort Dunlop, Birmingham.

313,325. CASTING CERAMIC ARTICLE. A. O. Austin, Barberton, O., U. S. A.

313,683. COMPRESSIBILITY TESTER AND GRADER. Dunlop Rubber Co., Ltd., 32 Osnaburgh St., London, and T. Cropper, Fort Dunlop, Birmingham.

313,701. SLICING MACHINE. E. Coulson, 16 Heathfield Terrace, Chiswick, London.

314,073.† TIRE RETREADER. J. C. Heintz, 3728 W. 143rd St., Cleveland, O., U. S. A.

314,249. FOOTWEAR APPARATUS. A. A. Glidden, 65 Adams Ave., T. M. Knowland, 76 Bradford Rd., both in Watertown, and L. H. Burnham, East St., Lexington, all in Mass., U. S. A.

† Not yet accepted.

France

660,299. SOLE SEWING MACHINE. United Shoe Machinery Cy. de France.

660,332. SOLE DRESSING MACHINE. United Shoe Machinery Cy. de France.

660,522. PRESS CUSHION FOR FOOTWEAR. O. Michalk.

661,190. VULCANIZATION APPARATUS. T. Durst.

661,559. SOLE MACHINE. F. Orus.

662,362. MECHANICAL CUTTING DEVICE. Chas. Macintosh & Co., Ltd.

662,534. SOLE VULCANIZING PRESS. A. Caramanian and L. Trouve.

Germany

481,782. VULCANIZING APPARATUS. The Akron Standard Mold Co., Akron, O., U. S. A. Represented by G. Benjamin and H. F. Wertheimer, both of Berlin-Charlottenburg.

482,027. VULCANIZING APPARATUS. The Dunlop Rubber Co., Ltd., London, England. Represented by M. M. and Dr. R. Wirth, C. Weihe, and Dr. H. Weil, all of Frankfurt a. Main, and T. R. Koehnhorn and E. Noll, both of Berlin S. W. 11.

482,148. KNEADING MACHINE. The Dunlop Rubber Co., Ltd., London, England. Represented by M. M. and Dr. R. Wirth, C. Weihe, and Dr. H. Weil, all of Frankfurt a. Main, and T. R. Koehnhorn and E. Noll, both of Berlin S. W. 11.

482,149. DISK ADJUSTER FOR HEEL-MOLDS. M. G. Bertone, New York, N. Y., U. S. A. Represented by G. Hirschfeld, Berlin S. W. 68.

482,319. JAR-RING MARKER AND CUTTER. E. Kober, Langestrasse 27, Stuttgart.

Designs

1,082,163. BRAIDING MACHINE. C. P. Muller G.m.b.H., Heckinghauserstrasse 181-183, Barmen-Rittershausen.

1,082,370. MOLD FOR HOSE, ETC. Berlin-Rixdorfer Gummiwaaren-Fabrik Hans Schumann, Mullerstrasse 171a/172, Berlin N. 39.

1,082,619. VULCANIZING APPARATUS. The Liverpool Rubber Co., Ltd., Liverpool, England. Represented by M. M. and Dr. R. Wirth, C. Weihe, and Dr. H. Weil, all of Frankfurt a. Main, and T. R. Koehnhorn and E. Noll, both of Berlin S. W. 11.

Process

United States

1,724,426. TIRE VALVE MANUFACTURE. M. C. Schweinert, New York, assignor to A. Schrader's Son, Inc., Brooklyn, both in N. Y.

1,725,749. WATERPROOF SEAM. G. W. Blair, assignor to Mishawaka Rubber & Woolen Mfg. Co., both of Mishawaka, Ind.

Dominion of Canada

291,838. INSULATING MATERIAL. W. S. Smith, Newton Poppleford, Devonshire, H. J. Garnett, Sevenoaks, Kent, and H. Charles, Channon, Kensington, London, co-inventors, all in England.

291,975. PNEUMATIC TIRE. The Goodyear Tire & Rubber Co., assignee of R. E. Jenkinson, both of Akron, O., U. S. A.

291,976. TIRE REPAIRING. The Goodyear Tire & Rubber Co., assignee of C. H. Zimmerman, both of Akron, O., U. S. A.

France

660,634. ELASTIC TIRE PRODUCTION. I. G. Farbenindustrie A. G.

661,170. PRODUCING INNER TUBES. C. S. Moomy.

661,897. FOOTWEAR PRODUCTION. D. F. Wilhelmi.

Germany

481,283. LINING UTENSILS. Gummiwerk Ernst Kniepert, Lobau, Sa.

Chemical

United States

1,723,083. ELECTRO DEPOSITION. S. E. Sheppard and L. W. Eberlin, Rochester, N. Y., assignors to American Anode, Inc., a corporation of Del.

1,723,581. LATEX COMPOSITION. Prepared for waterproofing paper. A. Ruderman, New York, N. Y.

1,723,632. COATING COMPOSITION. C. M. Stine and C. Coolidge, assignors to E. I. du Pont de Nemours & Co., all of Wilmington, Del.

1,724,180. ACCELERATOR. S. M. Cadwell, Leonia, N. J., assignor to The Naugatuck Chemical Co., Naugatuck, Conn.

1,724,270. AZO DYES FROM RUBBER DERIVATIVES. H. L. Fisher, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.

1,724,549. ACCELERATOR MANUFACTURE. T. W. Bartram and W. C. Weltman, Nitro, W. Va., assignors to The Rubber Service Laboratories Co., Akron, O.

1,724,580. ACCELERATOR MANUFACTURE. C. N. Hand and C. E. Smith, Nitro, W. Va., assignors to The Rubber Service Laboratories Co., Akron, O.

1,724,906. LATEX-PROTEID VULCANIZABLE COMPOUND. W. W. Christmas, Ridgefield Park, N. J.

1,725,564. RUBBER PRESERVATIVE. W. S. Calcott and W. A. Douglass, both of Penns Grove, N. J., and O. M. Hayden, assignors to E. I. du Pont de Nemours & Co., both of Wilmington, Del.

1,726,473. METAL COATING COMPOSITION. W. P. Davey, Schenectady, N. Y., assignor to General Electric Co., a corporation of N. Y.

Dominion of Canada

291,655 and 291,656. RUBBER COMPOSITION. C. H. Campbell, Pittsburgh, Pa., U.S.A.

291,821. LATEX THICKENING PROCESS. Veedip, Ltd., assignee of S. D. Sutton, both of Brantford, Co. of Middlesex, England.

291,971. ANTIOXIDANT. The Goodyear Tire & Rubber Co., assignee of A. M. Clifford, both of Akron, O., U.S.A.

291,972. ACCELERATOR. The Goodyear Tire & Rubber Co., assignee of L. B. Sebrell, both of Akron, O., U.S.A.

291,973 and 291,974. ANTIOXIDANT. The Goodyear Tire & Rubber Co., assignee of A. M. Clifford, both of Akron, O., U.S.A.

291,982. TIRE TREAD COMPOSITION. The Goodyear Tire & Rubber Co., assignee of R. E. Jenkinson, both of Akron, O., U.S.A.

United Kingdom

312,061.† PIGMENTS. Used in japans and with latex. E. I. du Pont de Nemours & Co., assignee of C. Coolidge and H. S. Holt, all of Wilmington, Del., U.S.A.

312,069.† ACCELERATOR. I. G. Farbenindustrie A. G., Frankfort-on-Main, Germany.

312,201. SYNTHETIC RUBBER. J. Y. Johnson, 47 Lincoln's Inn Fields, London. (I. G. Farbenindustrie A. G., Frankfort-on-Main, Germany).

312,372. BITUMINOUS COMPOSITIONS. Used in road making. J. J. V. Armstrong, 12 Church St., Liverpool. (G. Plauson,

†Not yet accepted.

51 Hagedornstrasse, Hamburg, Germany.)

312,443. DEODORIZING RUBBER. Dunlop Rubber Co., Ltd., 32 Osnaburgh St., London, and E. W. Madge, Fort Dunlop, Birmingham.

312,610.† ADHESIVE COMPOSITION. Minnesota Mining & Mfg. Co., assignee of R. G. Drew, both of St. Paul, Minn., U.S.A.

312,630.† RUBBER PRESERVATIVE. The B. F. Goodrich Co., New York, N. Y., assignee of W. L. Semon, Cuyahoga Falls, O., U.S.A.

312,644.† LEATHER SUBSTITUTES. M. M. Ehrlich. 108 Rue de la Chapelle, Paris, France.

312,741. SYNTHETIC RUBBER. E. Kleiber and P. Gilardi, both of Lugano, Switzerland.

312,947. THICKENING LATEX. Zinc oxide is used as a thickener. S. D. Sutton and Veedip, Ltd., both of Brentford, Middlesex.

312,949. SYNTHETIC RUBBER. J. Y. Johnson, 47 Lincoln's Inn Fields, London. (I. G. Farbenindustrie A. G., Frankfort-on-Main, Germany.)

313,027. AQUEOUS DISPERSION. Preparation of rubber for dispersion and compounding. Dunlop Rubber Co., Ltd., 32 Osnaburgh St., London, W. H. Chapman and P. D. Patterson, both of Fort Dunlop, Birmingham.

313,028. COMPOSITION. Dunlop Rubber Co., Ltd., 32 Osnaburgh St., London, W. H. Chapman and P. D. Patterson, both of Fort Dunlop, Birmingham.

313,052.† ABSORBENT. Porous rubber used for filtering, etc. H. Beckmann, 26 Albertinstrasse, Zehlendorf, Berlin, Germany.

313,252. FACTICE. Imperial Chemical Industries, Ltd., Millbank, London, and W. J. S. Naunton, Crumpsall Vale Chemical Works, Blackley, Manchester.

313,373. COMPOSITION. A substitute for gutta percha containing resin, wax, and aluminum soap in emulsion used to coagulate rubber latex. E. S. Ali-Cohen, 43 Stadhoudersplein, The Hague, Holland.

313,440.† SYNTHETIC RUBBER. I. G. Farbenindustrie A. G., Frankfort-on-Main, Germany.

313,486.† ANTIOXIDANT. The Goodyear Tire & Rubber Co., assignee of A. M. Clifford, both of Akron, O., U. S. A.

313,569.† POLYMERIZED PRODUCTS. Synthetic rubber. I. G. Farbenindustrie A. G., Frankfort-on-Main, Germany.

313,919.† COLD VULCANIZATION METHOD. The use of an alkyl or aryl sulphur halide or derivative in the presence of an indifferent solvent. I. G. Farbenindustrie A. G., Frankfort-on-Main, Germany.

†Not yet accepted.

General

United States

1,721,509. RESILIENT WHEEL. R. J. D'Aquin, New Orleans, La.

1,721,518. TIRE-FILLING CONNECTION. C. F. Larzelere, Flint, assignor to General Motors Corp., Detroit, both in Mich.

1,721,599. RUBBER HEEL. E. J. Kroeger, assignor to J. R. Gammeter, both of Akron, O.

1,721,739. BREAST PROTECTOR. D. J. Kennedy, Yonkers, N. Y.

1,721,771. TIRE VALVE. W. E. Copithorn, Natick, Mass.

1,721,806. TUBING OIL SAVER. E. V. Crowell, Los Angeles, Calif., assignor of one-half to the Guiberson Corp., Dallas, Tex.

1,721,982. RUBBER HEEL. G. H. Willis, assignor to J. L. Snyder, both of Akron, O.

1,722,056. GARMENT HOLDER. H. G. McComb, Bronx, N. Y.

1,722,309. CUSHION HEEL. C. Roberts, Winchester, Mass., assignor, by mesne assignments, to United Shoe Machinery Corp., Paterson, N. J.

1,722,345. TIRE GAGE. H. N. Thune, Climax, Minn.

1,722,346. FLEXIBLE HANDHOLE COVER. C. A. Van Dusen, assignor to The Glenn L. Martin Co., both of Cleveland, O.

1,722,366. HEAD-LAMP ANTI-GLARE DEVICE. L. M. Bowman, Hollywood, Calif.

1,722,650. BATTERY JAR. J. H. Wagenhorst, Jackson, Mich.

1,722,851. MICROPHONE. B. F. Miessner, South Orange, N. J., assignor to Wired Radio, Inc., New York, N. Y.

1,723,024. FACIAL MASSAGE DEVICE. A. M. Fisher, Los Angeles, Calif.

1,723,124. RAZOR SHARPENER. J. Bencze, Yorkville, O.

1,723,217. FOOTWEAR REPAIR SOLE. A. Szekeres, Trenton, N. J.

1,723,305. DOOR CLOSURE. H. E. Sipe, New York, N. Y.

1,723,306. RESILIENT ATTACHING STRIP. H. E. Sipe, New York, N. Y.

1,723,307. COUPLING STRIP. H. E. Sipe, New York, N. Y.

1,723,308. GLASS MOUNTING. H. E. Sipe, New York, N. Y.

1,723,309. LOCK STRIP. H. E. Sipe, New York, N. Y.

1,723,388. TIRE-VALVE STEM. W. C. Stevens, assignor to The Firestone Tire & Rubber Co., both of Akron, O.

1,723,402. SWIMMING COSTUME. M. W. Browdy, London, England.

1,723,435. CUSHION TIRE. M. C. Overman, New York, N. Y., assignor to Overman Cushion Tire Co., Inc., a corporation of N. Y.

1,723,482. SEALING INFLATABLE BODIES. B. L. Henry, New York, N. Y.

1,723,731. NURSING-BOTTLE HOLDER. R. Hafling, Brooklyn, N. Y.

1,723,765. DRAIN-PIPE CLEANER. A. J. Churchill, assignor to H. Graves and W. Miller, all of Los Angeles, Calif.

1,723,833. SANITARY DIAPER COVER. G. B. Young, Oklahoma City, Okla.

1,723,855. INFLATABLE ARTICLE VALVE. B. L. Henry, New York, N. Y.

1,724,020. TIRE ALARM. D. M. Harrington, Denver, Colo.

1,724,063. INFLATING AND DEFLATING VALVE. M. E. Anderson, Denver, Colo.

1,724,349. SHOE-HEEL CUSHION. E. N. Haag, Philadelphia, Pa.

1,724,450. SLIPPER. J. T. Callahan, assignor to Archer Rubber Co., both of Milford, Mass.

1,724,567. TIRE GAGE. C. H. Deren, assignor to O. E. Tepe, both of Brooklyn, N. Y.

1,724,592. PLUG AND SOCKET BODY. F. W. Hudson, assignor to J. L. Adams, both of San Francisco, Calif.

1,724,785. WATER-VAPOR ATTACHMENT. R. G. Thomas, San Diego, Calif.

1,724,893. MASSAGE APPARATUS. L. M. Baginski, Berlin-Pankow, Germany.

1,724,959. AIRCRAFT WIRE END SEAL. G. A. Page, Jr., Freeport, and F. H. Russell, Hempstead, both in N. Y., assignors to Curtiss Aeroplane & Motor Co., Inc., a corporation of N. Y.

1,725,065. GLOVE. J. M. Edwards, Waupaca, Wis., assignor of fifty per cent to J. J. and S. J. Burke, Dubuque, Iowa.

1,725,166. BOTTLE AND NIPPLE. J. Spanier and B. Weiss, assignors to H. Boyarsky and G. Hornick, all of New York, N. Y.

1,725,251. CURL-RETAINING CAP. R. Burke, Lyndhurst, N. J.

1,725,347. RUBBER BOOT. A. A. Glidden and T. M. Knowland, assignors to Hood Rubber Co., all of Watertown, Mass.

1,725,479. CUSHION CONSTRUCTION. P. Rissmann, assignor to Premier Cushion Spring Co., both of Detroit, Mich.

1,725,519. SHOE SOLE. W. B. Hopwood, College Point, N. Y., assignor to The Beacon Falls Rubber Shoe Co., Beacon Falls, Conn.

1,725,523. YIELDING CONNECTION. W. C. Keys, Detroit, Mich., assignor to The Mechanical Rubber Co., Cleveland, O.

1,725,547. AIR CUSHION HEEL. C. Spear, Oak Tree, N. J.

1,725,675. TEXTURE MANUFACTURE. G. A. Sallmann, Pleissa, near Limbach, Germany.

1,725,741. LEATHER LEGGING GUARD. H. Strunz, Anreppen, near Dellbruck, Germany.

1,725,831. SOUNDING TOY. F. R. Sherman, Cleveland, O.

1,725,836. JOINT PACKING. J. C. Solberg, Arlington, assignor of one-half to F. C. Langenberg, Cambridge, both in Mass.

1,725,882. TIRE RESILIENT INSERT. H. Prigge, New York, assignor of three-fourths to D. Hecht, Yonkers, both in N. Y.

1,725,973. FOUNTAIN PEN. D. Bensel, New York, N. Y., assignor to Wm. Demuth & Co., a corporation of N. Y.

1,726,026. TIRE. H. C. Hower, Chicago, Ill.

1,726,088. INFLATABLE BALL. A. J. Turner, assignor to Thos. E. Wilson & Co., both of Chicago, Ill.

1,726,101. ELECTRIC CONDUCTOR MOUNTING. W. R. Edson, New York, N. Y., assignor to The Rubber Shock Insulator Corp., Wilmington, Del.

1,726,243. PNEUMATIC TIRE SIGNAL. J. M. Scott and W. L. Dayton, both of Fort Worth, Tex.

1,726,385. VEHICLE WHEEL. D. Collins, New York, N. Y.

1,726,432. FOUNTAIN PEN. G. W. Gilman, assignor to Carona Pen Co., Inc., both of Janesville, Wis.

Dominion of Canada

291,520. BALL CUSHION TIRE. P. Magnus, Leichhardt, near Sydney, New South Wales, Australia.

291,552. COUPLING. The Aerocar Corp., New York, N. Y., assignee of G. H. Curtiss, Country Club Estates, Fla., both in the U. S. A.

291,840. RUBBER HEEL. H. H. Rannard and P. F. Blore, co-inventors, both of Winnipeg, Man.

291,904. HOT WATER BOTTLE. S. L. Palmer, Teaneck, N. J., U. S. A.

291,954. HEADER STRIP. The Detroit Rubber Products, Inc., assignee of W. W. Metzger, both of Detroit, Mich., U. S. A.

292,099. HARNESS AND COLLAR PAD. B. E. Katz, Winside, Neb., U. S. A.

292,105. BATHING GARMENT. C. E. Maillols, Paris, Seine, France.

292,187. HEEL. The Letchford Rubber Co., Ltd., assignee of P. H. Letchford, both of Winnipeg, Man.

292,264. FOOTWEAR. R. Butler, Woodstock, Ont.

292,298. NECKTIE. H. Leoni, New York, N. Y., U. S. A.

292,317. PNEUMATIC TIRE. W. Rohrbeck, Berlin-Reinickendorf-Ost, Germany.

United Kingdom

312,129 and 312,139. AIRCRAFT WHEEL MOUNTING. India Rubber, Gutta Percha & Telegraph Works Co., Ltd., 106 Cannon St., and W. L. Avery, of India Rubber, Gutta Percha & Telegraph Works, Silvertown, both in London.

312,409. LOUDSPEAKER DIAPHRAGM. R. A. Eliot (trading as Neophone Engineering Co.), 9 Little Andrew St., St. Martin's Lane, London.

312,410. AIRCRAFT SHOCK-ABSORBER. G. H. Dowty, 6 Lansdown Terrace, Cheltenham, Gloucestershire.

312,421. DRAUGHT EXCLUDER. J. West, 229 Clarendon Rd., Whalley Range, Manchester.

312,464. BUOYANT ROPE. J. C. Hoos, 60 Stationsweg, The Hague, and Société Belge Du Caoutchouc Mousee, Berchem-Ste-Agathe, Belgium.

312,480. HAIR-WAVING APPLIANCE. W. Belcher, 36 Grange Gardens, Southend-on-Sea.

312,519. BEAUTY AID CAP. D. W. Leyland, 94A Fulham Rd., South Kensington, London.

312,611.† VEHICLE BUMPER. G. Dall'oglio, 8 Via 12 Guigno, Bologna, Italy.

312,647.† STOCKING SUSPENDER. A. and A. Stanger, (née Gloe), 136 Hauptstätterstrasse, Stuttgart, Germany.

312,680.† LACE FOR FOOTWEAR. J. D. Macdonald, 54 Moruben Rd., Mosman, near Sydney, Australia.

312,708. MOTORCYCLE. A. V. Mellano, 6 Queens Dr., Thames Ditton, Surrey.

312,828. DRY CELL BATTERY. H. Shimidzu, 81 Saka Machi, Yotsuya Ku, Tokyo.

312,892. STIPPLING BRUSH. A. C. Sakowich, Oak St., New Hyde Park, Long Island, N. Y., U. S. A.

312,934.† TIRE CASING. Dunlop Rubber Co., Ltd., 32 Osnaburgh St., London, assignee of A. J. Slatter, c/o Dunlop Tire & Rubber Corp., Buffalo, N. Y., U. S. A.

313,023. AIR CUSHION. Avon India Rubber Co., Ltd., and W. J. Harris, Waverley, Spa Rd., both in Melksham, Wiltshire.

313,359. FACE TREATING APPLIANCE. C. A. Riess, General Bldgs., Aldwych, London.

313,391. SHOE HEEL. H. H. Schwartz, 20 Sicles St., New York, N. Y., U. S. A.

313,393. TIRE DEFLATION INDICATOR. E. R. Woods, 1290 E. Sixth St., N., Portland, Ore., U. S. A.

313,517.† ABRASIVE WHEEL. G. W. Perks Co., 31 W. Market St., assignee of J. R. Gammeter, 680 N. Portage Path, both of Akron, O., U. S. A.

313,649. PNEUMATIC TIRE. Roadless Traction, Ltd., and P. H. Johnson, Gunnersbury House, Hounslow, Middlesex.

313,716. SOLE. K. A. H. Paterson, 7 Dalziel Dr., Maxwell Park; J. S. and R. D. Paterson, (trading as A. & W. Paterson), 80 Glassford St., both in Glasgow.

313,717. SHOE STIFFENER. W. Mason (Leicester), Ltd., and B. G. Heath, Doncaster Rd., Leicester.

313,792. GRAMOPHONE SOUNDBOX. Limit Engineering Co., Ltd., and N. Collins, 17 Albion St., King's Cross, London.

313,809. TIRE PUMP CONNECTOR. E. H. Hill, 56 Broomhall St., Sheffield.

313,823. SCALP MASSAGER. F. B. Dehn, 103 Kingsway, London. (L. M. Baginski Fabrik Orthop Apparate Ges., 10 Hidenseestrasse, Pankow, Berlin.)

313,871.† GRAMOPHONE MOTOR. Excelsiorwerk Metallwarenfabrik Akt.-Ges., 121 Niehlerkirchweg, Nippes, Cologne, Germany.

313,894. HAIR-DRYING APPARATUS. C. A. Cooper, 25 Holborn Viaduct, London.

313,990. PICK-UP AND LOUDSPEAKER. R. L. Aspden, 6 Southport Rd., Chorley, Lancashire.

314,150. SURGICAL SYRINGE CARTRIDGE. W. W. Groves, 30 Southampton Bldgs., London. (Cook Laboratories, Inc., 536 Lake Shore Dr., Chicago, Ill., U. S. A.)

314,168. TENNIS BALL. F. H. Ayres, Ltd., 111 Aldersgate St., London, C. M. Ayres, Nuns Croft, and J. H. Smith, Lingham, Higham Lane, both in Nuneaton.

314,180. CRICKET BALL. Hermetic Rubber Co., Ltd. (formerly Self-Sealing Rubber Co., Ltd.), and G. F. Colledge, Hermetic Works, Ryland St., Birmingham.

314,193. FURNITURE CASTOR CUP. A. B. Shorney, Shebbear College, Beaworthy, North Devon. (C. Gebhard, 1249 E. 56th St., Los Angeles, Calif., U. S. A.)

314,201. GUNNERY PRACTICE PROJECTILE. C. Macintosh & Co., Ltd., G. F. Thompson, and S. A. Brazier, 2 Cambridge St., Manchester.

314,211. WEAVERS' SHUTTLE THREADER. W. S. and W. L. Draper, 16 Clive St., Burnley.

314,212. HEEL PROTECTOR. P. L. Smith, 103 Little Ealing Lane, Ealing, London.

France

661,143. HEELS. A. M. Machado da Cruz.

661,169. FOOTWEAR. A. Lasbats.

661,638. PNEUMATIC TIRES. M. R. Huybrechts.

661,654. PROTECTIVE LAYER FOR TIRES. A. Forner.

661,940. TIRE TREADS. The Dunlop Rubber Co., Ltd.

Germany

481,277. EXCHANGEABLE SOLE. G. Krumm, Cannstatt.

481,571. GYMNASTIC APPARATUS. E. Just, Bonnaskenstrasse 11, Cottbus.

481,974. SOLE. F. Mehli, Zurich, Switzerland. Represented by Drs. W. Karsten and C. Wiegand, Berlin S. W. 11.

482,232. SOLID AND CUSHION TIRE. A. G. Metzeler & Co., Munich.

Designs

1,081,269. TIRE. J. Middeldorf, Harskampstrasse 17, Aachen.

1,081,287. MILK-BOTTLE NIPPLE. J. Gareis, Hechtstrasse 11, Dresden-N.

1,081,342. GAITERS. Dr. M. Grossmann, (née Luback), Halberstadt.

1,081,356. APRON. Firma M. Steinberg, Cologne-Braunsfeld.

1,081,404. STOCKING. Firma August Pfuller, Zeulenroda.

1,081,485. BATH MAT. Continental Gummi-Werke A.G., Hannover.

1,081,620. HOSE. A. Schiebenhover, Hochallee 43, Hamburg 37.

1,081,703. ELASTIC STOCKING. Dr. J. Dickmann, Prenzlauerstrasse 44, Berlin C. 25.

1,081,723. BATHING CAP. Harburger Gummiwarenfabrik Phoenix, A.G., Harburg-Wilhelmsburg.

1,081,780. FAUCET CONE. C. Hilbert, Luisenstrasse 5, Wiesbaden.

1,081,830. ENDLESS BELT. C. Dahlmann, Lindenstrasse 16, Stuttgart.

1,082,070. CORN PROTECTOR. Zellkautschuk G.m.b.H., Lohergraben 44, Aachen.

1,082,382. OBJECT WITH METALLIC LUSTER. Baltic India Rubber Co., Quadrat, Riga, Latvia. Represented by F. Neubauer, Berlin W. 9.

1,082,455. ANTI-SKID DEVICE. F. Hamacher, Jagerhofstrasse 30, Dusseldorf.

1,082,733. REENFORCED RUBBER. Firma M. Steinberg, Cologne-Braunsfeld.

1,082,883. TOILET ACCESSORIES. Rheinische Gummi-und Celluloidfabrik, Mannheim-Neckarau.

1,083,040. SITZ-BATH. A. Tangel, Frankenstrasse 2, Karlsruhe i. B.

1,083,303. WATERPROOF TURBAN. Harburger Gummiwarenfabrik, Phoenix, A. G., Harburg-Wilhelmsburg.

1,083,401. KNEE-GUARDS. O. Wegener, Tomasstrasse 40, Mulheim a. d. Ruhr.

1,083,464. PNEUMATIC MATTRESS. L. Pfennig, Giesbergstrasse 24, Kassel.

1,083,587. HORSE-SHOE LINING. E. Frese, Gr. Johannisstrasse 76, Bremen.

1,083,660. BALL. Firma Philipp Herz, Windsheim, Mittelfr.

1,083,756. PACKING FOR DOORS. W. Bickart, Wilhelmstrasse 5, Kassel.

Trade Marks

United States

259,193. TENSILASTIC. Rubber squeezing rolls for all kinds of machinery. American Wringer Co., Inc., Woonsocket, R. I.

259,217. HEAVY DUTY. Wheeled goods, viz, children's tricycles. Lewis E. Myers & Co., Valparaiso, Ind., assignor to The Northern Trust Co. and H. H. Rockwell, trustees.

259,218. HEAVY DUTY JR. Wheeled goods, namely, children's tricycles. Lewis E. Myers & Co., Valparaiso, Ind., assignor to The Northern Trust Co. and H. H. Rockwell, trustees.

259,224. NEVA-KREASE. Linings for cravats or neckties. Super-Rubber Lining Corp., New York, N. Y.

259,237. Rectangle containing the words: "JAY-COBBS, INC., FIFTH AVENUE, SMART FEMININE WEARABLES." Women's and misses' rubber and leather boots and shoes, corsets, brassieres, and other garments. Jay-Cobbs, Inc., New York, N. Y.

259,238. JAY-COBBS. Women's and misses' rubber and leather boots and shoes, corsets, brassieres, and other garments. Jay-Cobbs, Inc., New York, N. Y.

259,300. Circle containing a representation of an elk's head and around the circle the words: "LOUCKS MAKE." Gloves of leather, rubber, or fabric, and of combinations of these materials. W. I. & M. A. Loucks, Inc., Gloversville, N. Y.

259,303. SUPREME. Resilient vehicle tires and tubes of rubber, or rubber composition, or fabric and rubber. The Firestone Tire & Rubber Co., Akron, O.

259,330. ENSEMBLE. Dress shields. I. B. Kleinert Rubber Co., New York, N. Y.

259,332. JEWEL. Dress shields. I. B. Kleinert Rubber Co., New York, N. Y.

259,336. The words: "JUVENILE FOOTWEAR" separated by a leaf design containing the words: "CENTRI-FLEX."

Juvenile shoes of rubber, leather, and fabric materials. Wm. F. Jantzen, White Plains, N. Y.

259,348. KIDIFORM. Children's shoes of leather, rubber, fabric, and/or combinations thereof. Stern Bros., New York, N. Y.

259,356. TOWN WELT. Leather, cloth, and rubber boots, shoes, and slippers. H. W. Hanan, doing business as Hanan & Son, Brooklyn, N. Y.

259,377. MIRELLE. Dress shields. I. B. Kleinert Rubber Co., New York, N. Y.

259,425. THERMOID C-A-L BRAKE LINING. Brake linings. Thermoid Rubber Co., Hamilton Township, Mercer Co., Trenton, N. J.

259,505. FAN-TAN. Tennis shoes or sneakers with canvas or fabric uppers and vulcanized rubber bottoms. Endicott Johnson Corp., Endicott, N. Y.

259,506. SUPERCRAFT. Shoes and boots of leather, rubber, and other fabrics, and combinations of any of these materials. The Excelsior Shoe Co., Portsmouth, O.

259,508. PRONYDE. Prepared proteid material for use in rubber manufactures. American Glue Co., Boston, Mass.

259,554. Representation of a star above which is the word: "SPECIAL." Hoof pads. Dryden Rubber Co., Chicago, Ill.

259,688. Representation of part of a boat on rough waters, with a woman standing against the mast, and the words: "LONDON — WATERPROOF. PARIS — IMPERMEABLE." Raincoats, waterproof vests and pants, ladies' waterproof suits, hats and shoes of rubber or fabric or combinations of these materials. I. Schourmann, Paris, France.

259,785. JEWEL. Baby pants. I. B. Kleinert Rubber Co., New York, N. Y.

259,832. — WEAREVER —. Automobile brake linings. Royer-Ziegler Co., Norristown, Pa.

259,899. BARDOL. Hydrocarbon oil used in the processing and treating of rubber and as a dispersing agent and/or antioxidant in the compounding of rubber. The Barrett Co., New York, N. Y.

260,001. HICKORY. Balls. A. Stein & Co., Chicago, Ill.

260,008. "ONE TRIP PLUMBERS." Tank balls, stoppers, and other plumbing supplies. East End Plumbing & Heating Co., Moline, Ill.

260,126. FLEX SHANK. Shoes of leather, fabric, rubber, and combinations of said materials. The United States Shoe Co., Cincinnati, O.

260,155. Rectangle containing designs in colors modeled after traffic lights such as circles and an arrow, and the words: "ADA-WALKER HYGIENIC FOOTWEAR. STOP. WAIT. GO. ONE WAY." Boots, shoes, and slippers of leather, rubber, and/or fabric, or any combination thereof. H. H. Roosa, Lincoln, Neb.

260,180. Circle with a dark background containing the representation of a mountain peak on which are two eagles, and below the circle the words: "DOUBLE EAGLE." Soles and heels for boots and shoes wholly or partly of rubber. The Goodyear Tire & Rubber Co., Akron, O.

260,459. Rectangle containing a representation of a bridge and a sky-line and the words: "'BUILT FOR WEAR' STURDIBILT." Shoes of leather, canvas, rubber, or combinations thereof. Jefferson Shoe Mfg. Co., Inc., Brooklyn, N. Y.

260,518. Circle containing the words: "TRIPLE A." Tires wholly or partly of rubber and tubes therefor. Corduroy Tire Co., Grand Rapids, Mich.

260,539. Representation of a propeller, and above the word: "PROPELLER." Transmission belting, hose, and packings for machinery. The Intermountain Belting & Packing Co., Denver, Colo.

260,555. SOPENNA. Pneumatic-tire casings. Standard Oil Co. of Pennsylvania, Philadelphia, Pa.

260,607. LILY PADS. Bath mats wholly or partly of rubber. I. B. Kleinert Rubber Co., New York, N. Y.

260,660. SPORTFAIR. Rubberized raincoat fabrics. L. C. Chase & Co., Boston, Mass.

260,672. LINDY ANNE. Raincoats. Cable Raincoat Co., Boston, Mass.

260,763. LYNDE-LYD. Helmets of textile fabric, rubber, and leather. The Newcomer Glove Co., Toledo, O.

260,828. ENDWELL. Golf balls. Endicott Johnson Corp., Endicott, N. Y.

260,854. LECTRO. Rubber boots, shoes, overshoes, and rubber-soled canvas shoes. Hood Rubber Co., Watertown, Mass.

260,861. Rectangle containing the words: "ENDICOTT JOHNSON FARM RELIEF." Boots, shoes, and slippers of leather, rubber and/or fabric, or any combinations thereof. Endicott Johnson Corp., Endicott, N. Y.

260,874. TYRCURER. Tire-vulcanizing machines. The Akron Tyrwelder Co., Akron, O.

Dominion of Canada

46,762. Nipple having a band of contrasting colors other than red and blue. Nipples. R. G. A. Beck, Montreal, P. Q.

46,771. Words: "BECK'S SECURITY" enclosed in a substantially circular frame. Nursing bottles and nipples. R. G. A. Beck, Montreal, P. Q.

46,797. Name: "CAPTAIN." Golf balls. Wm. C. B. Wade, Toronto, Ont.

46,832. A circular device containing in the center within a double circle the monogram: "R. L. Co., Ltd." with the words: "ARTIFICIAL SILK" just above the smaller circles and provisions at the sides for stamping; in the upper third of the larger circular device, the words: "DURABLE KNICKER ELASTIC," and in the lower third "WASHING & BOILING DOUBLE STRETCH AND STRENGTH FINEST PARA RUBBER"—"MADE IN ENGLAND." Elastic. Robinson, Little & Co., Ltd., London, Ont., and Winnipeg, Man.

46,846. Words: "VINEGAIRE TAR." Product distilled from wood and used for compounding with rubber. R. T. Vanderbilt Co., Inc., New York, N. Y., U. S. A.

46,853. Word: "LINATEX." Crepe india rubber in sheets or slabs for use as protective covering to surfaces subjected to abrasive action. The Wilkinson Process Rubber Co., Ltd., 9-11 Old Market Sq., Kuala-Lumpur, Federated Malay States.

46,888. Words: "MANHATTAN TEE." Golf tees. The Manhattan Rubber Mfg. Co., Passaic, N. J., U. S. A.

46,944. Word: "SUN-KIST." Bathing shoes, caps, and other accessories, and clothing. The Ashbury Mills, New York, N. Y., U. S. A.

United Kingdom

500,034. SPENCER MOULTON. Pneumatic and solid tires and inner tubes for pneumatics. George Spencer, Moulton & Co., Ltd., 2 Central Bldg., Westminster, London, S. W. 1.

500,174. VULKETE. Substitutes for leather (not being leather cloth), and soles, heels, and tips for boots and shoes, all principally of india rubber. Sussex Rubber Co., Ltd., 32 Houndsditch, London, E. 1.

500,459. TEXROPE. Machine driving ropes principally of india rubber. Allis Chalmers Mfg. Co., West Allis, Milwaukee, Wis., U. S. A., and 728 Salisbury House, London, E. C. 2.

501,643. KILEX. Solution or cement composed of india rubber or gutta percha. The Albany Stain & Blacking Co., Ltd., Victoria Chemical Works, Victoria Rd. E., Leicester.

501,995. GUARANPRUFE. Raincoats. Brandons Progressive Tailors, Ltd., 346-48 Old St., Shoreditch, London, E. C. 1.

502,381. DOUBLE DECK. Automobile tires. S. T. Davies & Co., 314-16 Euston Rd., London, N. W. 1.

502,794. Double circle containing the words: "NORTH BRITISH RUBBER CO., LIMITED, EDINBURGH. EDINA N. B." Golf balls. The North British Rubber Co., Ltd., Castle Mills, Fountainbridge, Edinburgh.

504,527. RAINJOHN. Rainproof and waterproof garments. J. Abrahams, trading as The Standard Weathercoat Co., Standamac House, Fore St. Ave., London, E. C. 1.

Designs

United States

79,155. OVERSHOE. Term 7 years. H. P. Manville, New York, N. Y., assignor to The Goodyear's India Rubber Glove Mfg. Co., Naugatuck, Conn.

79,159. MAT. Term 14 years. C. H. Oakley, Trenton, N. J.

79,223 and 79,224. GOLF BALL. Term 14 years. V. B. C. Binnie, Handsworth, assignor to Dunlop Rubber Co., Ltd., Birmingham, both in England.

79,271. TIRE. Term 14 years. Wm. C. Tyler, assignor to Ajax Rubber Co., Inc., both of Racine, Wis.

79,289. OVERSHOE. Term 14 years. C. Ferrettie, assignor to Mishawaka Rubber & Woolen Mfg. Co., both of Mishawaka, Ind.

79,301. SHOE SOLE. Term 14 years. C. H. Oakley, assignor to Essex Rubber Co., both of Trenton, N. J.

79,302. HEEL. Term 14 years. C. H. Oakley, assignor to Essex Rubber Co., both of Trenton, N. J.

Dominion of Canada

8,428. MAT. The Goodyear Tire & Rubber Co. of Canada, Ltd., Toronto, Ont.

Labels

United States

36,166. RAIN TOGS. Rubber and canvas footwear. Hood Rubber Co., Watertown, Mass.

36,194. A VAGINAL GERMICIDAL JELLY HARD RUBBER VAGINAL INJECTOR (IMPROVED). Germicidal medicinal preparation and an injector. A. Gortz, doing business as Krasotka-Health Products Co., New York, N. Y.

36,247. USE THUNDERBOLT TWO BIT TIRE PATCH. Tire patches. F. J. Hagerling, St. Louis, Mo.

New Incorporations

Empire Rubber Corp., Sept. 16 (Delaware), capital stock 25,000 shares Class A preferred, 25,000 shares Class B common, and 50,000 shares Class C common, all without par value. C. S. Peabbles, L. E. Gray, and H. E. Grantland, all of Wilmington, Del. To manufacture and deal in rubber, gutta percha, rubber goods, and all goods of which rubber and gutta percha are component parts.

Groth Rubber Co., Inc., Sept. 7 (New York), $50,000. R. Rhyne, 14 S. Munn Ave., E. Orange, N. J., J. H. Groth, 260 Etna St., and W. W. Smith, 1832 E. Thirty-first St., both of Brooklyn, N. Y. Principal office, Kings County, N. Y. To manufacture rubber products.

Hood Rubber Co., Inc., Aug. 22 (Delaware), capital stock 60,000 shares par value $100. A. V. Lane, L. E. Gray, and H. E. Grantland, all of Wilmington, Del. To manufacture and deal with rubber and goods of which rubber is a component part.

Hood Rubber Products Co., Inc., Aug. 22 (Delaware), capital stock 1,000 shares par value $100. A. V. Lane, L. E. Gray, and H. E. Grantland, all of Wilmington, Del. To manufacture and deal in rubber and goods of which rubber is a component part.

Hygeia Corp. of America, Sept. 11 (Delaware), capital stock 50.000 shares no par value. H. J. Carswell, Waycross, H. H. Bell, and J. F. Carswell, both of Augusta, and all in Georgia. To manufacture and sell syringes, nozzles, etc., and deal in all forms of rubber goods.

Pneumatic Rubber Heel Corp., Sept. 9 (Delaware), capital stock 100,000 shares common par value $10. F. L. and M. E. Mettler, and P. M. Gilkey, all of Wilmington, Del. To manufacture pneumatic heels.

Robinson Scrap Rubber Co., Aug. 19 (New Jersey), capital stock 500 shares par value $100. G. W. and G. M. Robinson, and R. W. and A. Sims, all of West Orange, N. J. Principal office, 370 Valley Rd., West Orange, N. J. To deal in scrap rubber.

Universal Tire Tread Co., July 29 (Delaware), capital stock 1,000 shares preferred, par value $100, and 25,000 shares common, par value $10. M. M. Lucey, R. E. Thompson, and H. B. Money, all of Wilmington, Del. To manufacture and deal in tires, tubes, and automobile accessories.

V. M. & P. Naphtha

V. M. & P. naphtha, varnish makers' and painters' grade, is that commonly used by rubber workers for cleaning and restoring tackiness to raw rubber surfaces, and as a solvent in cement and rubber proofing compositions.

Like kerosene, V. M. & P. naphtha is a refined petroleum product made to a single standard of quality for use by a number of unrelated industries. There is no generally accepted specification for its quality. A typical V. M. & P. naphtha will have a boiling point of about 175° F. and final boiling point of about 385° F. Its odor will be sweet, color, water white, and it will contain somewhat less than 0.10 per cent of sulphur.

Komac

An entirely new bituminous product known as Komac has been developed. It is neither coal-tar pitch nor asphalt but is distinctive in character and unlike any material heretofore produced. It is commercially available in many grades designed to meet particular needs. Komac products are characterized by their low temperature susceptibility, that is they have excellent resistance to temperature changes. This material is available in any desired softening temperature from liquid consistency to tough high melting point solids. It can be made to order in many combinations of physical properties to meet individual requirements and has been suggested as a valuable adjuvant or softener in rubber compounding.

Rubber Guards Silk Loading

In a new process for continuous weighting of silk, where tin chloride is used along with formic acid and phosphate salts, followed with sodium silicate, all pipes and treating vessels are lined with rubber to protect them from acid action. British Patent No. 296,017, Aug. 23, 1927.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade. but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

Number	Inquiry
1251	Manufacturer of Vacco rubber sponge for cleaning hats.
1252	Manufacturer of testing machines for both hard and soft rubber.
1253	Manufacturer of Gossamer impression strips.
1254	Manufacturer of Aklowax Oil.

Foreign Trade Circulars

Special circulars containing foreign rubber trade information are now being published by the Rubber Division, Bureau of Foreign and Domestic Commerce, Washington, D. C.

Number	Special Circulars
2414	Canadian Tire Exports, First Half of 1929.
2415	Canadian Exports of Footwear, First Half of 1929.
2416	Canadian Exports of Belting, First Half of 1929.
2420	British Exports of Auto Tires and Inner Tubes, First Six Months of 1929.
2422	British Exports of Footwear, June and First Half of 1929.
2424	Comparative Exports of Boots and Shoes from United States, Canada, and United Kingdom, First Half of 1929.
2428	Annual Tire Report for Austria.
2430	French Footwear Exports, May, June, and the First Half of 1929.
2431	French Tire Exports, May and June, 1929.
2432	French Tire Exports, First Six Months of 1929.
2433	British Exports of Auto Tires and Inner Tubes, First Five Months of 1929.
2437	Crude Rubber Reexports from United States, July, 1929.
2438	Italian Markets for Toy Balloons.
2441	Czechoslovakia Tire Report.
2443	Dutch Native Rubber Production.
2445	Survey of Brazilian Tire Markets.

Foreign Trade Information

For further information concerning the inquiries listed below address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

Number	Commodity	City and Country	Purchase or Agency
40,345	Tire repair patches	Milan, Italy	
40,376	Tires	Funchal, Madeira	
40,377	Canvas rubber-soled shoes	Mayaguez, P. R.	
40,378	Toy animals	Hamburg, Germany	Purchase
40,379	Bathing caps, shoes, etc.	Amsterdam, Netherlands	Agency
40,380	Footwear	Berlin, Germany	Agency
40,381	Heels and soles	Frankfort, Germany	Agency
40,394	Galoshes	Vienna, Austria	Agency
40,416	Aprons	Hamilton, Canada	Purchase
40,457	Window channels for automobile bodies	Copenhagen, Denmark	Purchase
40,458	Tires	Winnipeg, Canada	Both
40,459	Fishermen's goods	Prince Rupert, Canada	Agency
40,545	Bathing caps and shoes	Budapest, Hungary	Both
40,588	Footwear	Stavanger, Norway	Either
40,599	Mechanical goods	Amsterdam, Netherlands	Agency
40,630	Toy balloons and novelties	London, England	Agency
40,639	Gray and red thread	Barcelona, Spain	Agency
40,649	Automobile carpets	Mexico City, Mexico	Both
40,679	Gaskets and packings	Prague, Czechoslovakia	Purchase
40,680	Hose, pump diaphragms, and technical goods	The Hague, Netherlands	Purchase
40,681	Erasers	Amsterdam, Netherlands	Either
40,682	Balata belting	Tallinn, Estonia	Agency
40,684	Bathing accessories	Melbourne, Australia	Agency
40,695	Overshoes	Vienna, Austria	Agency
40,696	Footwear	Vienna, Austria	Agency
40,754	Tires	Harbin, China	Agency
40,775	Shoes, heels, toys, and household goods	Cologne, Germany	Agency
40,828	Garden hose	Tientsin, China	Agency
40,842	Hunting boots	Rome, Italy	Agency
40,851	Bicycle tires and tubes	Tel-Aviv, Palestine	Agency

Tire Dealer Stock Survey—October 1

The survey of tire and tube stocks in the hands of dealers as of October 1, 1929, is now being made by the Rubber Division, Department of Commerce, Washington, D. C. Several new questions have been added to the questionnaire sent to dealers, and the final report will therefore contain new matter of interest to the whole trade. Tire dealers are requested to return the government report promptly.

MARKET REVIEWS

Crude Rubber

New York Exchange

SEPT. 3. Trading after Labor Day was dull; only 167 lots changed hands and prices, although 10 to 20 points lower, owing to lack of interest, showed no real trend. December was the active month with a loss of 10 points. Sept., 19.70; Oct., 20.10; Nov., 20.40; Dec., 20.80; Jan., 21.00; Feb., 21.20; Mar., 21.30; Apr., 21.50; May, 21.70; June, 21.90; July, 22.10; Aug., 22.30.

SEPT. 4. Again trading was dull, although London prices showed a little more strength. Quiet absorption and a slight buying movement advanced prices at the opening 10 to 20 points. Dullness ruled the balance of the day with spasmodic trading. Prices closed about 10 points up. Sept., 19.90; Oct., 20.20; Nov., 20.50; Dec., 20.90; Jan., 21.10; Feb., 21.30; Mar., 21.50; Apr., 21.70; May, 21.70; June, 21.80; July, 22.00; Aug., 22.40.

SEPT. 5. Trading continued dull and quiet while prices backed and filled in a 10-point range. There were few who really wanted to sell short; yet the leaning is towards the up side and quiet accumulation was going on. The general attitude is one of waiting. Sept., 19.80; Oct., 20.00; Nov., 20.40; Dec., 20.80; Jan., 21.00; Feb., 21.30; Mar., 21.40; Apr., 21.50; May, 21.70; June, 21.90; July, 22.10; Aug., 22.30.

SEPT. 6. Good resistance to selling pressure and little constructive news caused futures to hold very steady, although there was early selling by some uneasy holders on reports of an expected increase in London stock. This selling was quickly absorbed. Traders' ideas were mixed, but the net result was a recovery of 20 points from the lows with the market closing 10 points up on the day. Sept., 19.70; Oct., 20.00; Nov., 20.30; Dec., 20.80; Jan., 20.90; Feb., 21.20; Mar., 21.40; Apr., 21.50; May, 21.80; June, 22.00; July, 22.20; Aug., 22.40.

SEPT. 7. This was an unusually quiet Saturday with no price changes worth recording.

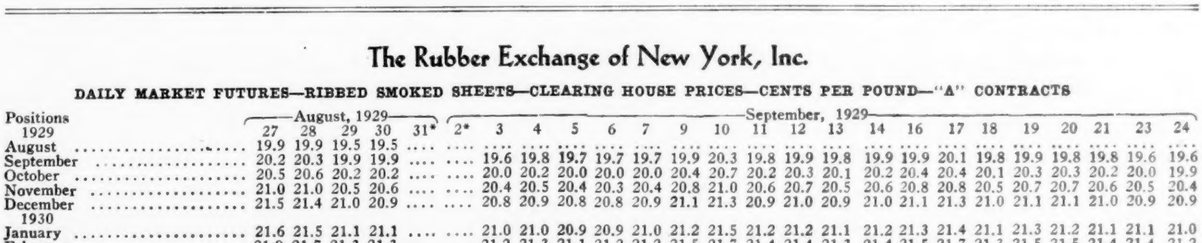
SEPT. 9. With steady London prices, in spite of an increase in stocks, prices opened up about 10 points. As the day progressed, buying support in all positions, together with short covering, ran prices up 30 and 50 points. There was good support at the close with bids for quantities at the highs. The market feeling changed for the better, and except for a little profit-taking few cared to go short. Sept., 19.90; Oct., 20.40; Nov., 20.80; Dec., 21.10; Jan., 21.20; Feb., 21.50; Mar., 21.70; Apr., 21.90; May, 22.10; June, 22.30; July, 22.50; Aug., 22.70.

SEPT. 10. London and Singapore cables were strong, and prices opened higher on the bids. Dealers' stocks in the Far East were reported off 300 tons and this helped prices. There was some short covering with the result that closing prices were all about 20 points above the last close. Sept., 20.30; Oct., 20.70; Nov., 21.00; Dec., 21.30; Jan., 21.50; Feb., 21.70; Mar., 21.90; Apr., 22.10; May, 22.30; June, 22.50; July, 22.70; Aug. 22.90.

SEPT. 11. The report that rubber invoiced to the United States for the week ended Sept. 7 was 11,298 tons as against 7,406 for Aug. 31 had a dampening effect on the bulls and they sold out taking what profits they could. The only real buying was the covering of shorts. Some others, however, were bullish for the long-pull futures. There was no excitement in the market, although prices receded about 30 to 40 points. Sept., 19.90; Oct., 20.20; Nov., 20.60; Dec., 20.90; Jan., 21.20; Feb., 21.40; Mar., 21.60; Apr., 21.70; May, 21.90; June, 22.10; July, 22.30; Aug., 22.50.

SEPT. 12. The market was so mixed the last few days that traders were puzzled and switched from one position to a forward one. Reports and guessing as to consumption caused uncertainty; so the trade preferred to wait for August consumption figures before making further commitments. Prices closed about 10 points up on the day. Sept., 20.00; Oct., 20.30; Nov., 20.70; Dec., 21.00; Jan., 21.20; Feb., 21.40; Mar., 21.60; Apr., 21.80; May, 22.00; June, 22.20; July, 22.30; Aug., 22.50.

New York Rubber Exchange Clearing House Prices—High and Low Weekly Changes on "A" Contracts for Monthly Futures



The Rubber Exchange of New York, Inc.

DAILY MARKET FUTURES—RIBBED SMOKED SHEETS—CLEARING HOUSE PRICES—CENTS PER POUND—"A" CONTRACTS

Positions	August, 1929					September, 1929																			
1929	27	28	29	30	31*	2*	3	4	5	6	7	9	10	11	12	13	14	16	17	18	19	20	21	23	24
August	19.9	19.9	19.5	19.5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
September	20.2	20.3	19.9	19.9	....	....	19.6	19.8	19.7	19.7	19.7	19.9	20.3	19.8	19.9	19.8	19.9	19.9	20.1	19.8	19.9	19.8	19.8	19.6	19.6
October	20.5	20.6	20.2	20.2	....	....	20.0	20.2	20.0	20.0	20.0	20.4	20.7	20.2	20.3	20.1	20.2	20.4	20.4	20.1	20.3	20.3	20.2	20.0	19.9
November	21.0	21.0	20.5	20.6	....	....	20.4	20.5	20.4	20.3	20.4	20.8	21.0	20.6	20.7	20.5	20.6	20.8	20.8	20.5	20.7	20.7	20.6	20.5	20.4
December	21.5	21.4	21.0	20.9	....	....	20.8	20.9	20.8	20.8	20.9	21.1	21.3	20.9	21.0	20.9	21.0	21.1	21.3	21.0	21.1	21.1	21.0	20.9	20.9
1930																									
January	21.6	21.5	21.1	21.1	....	....	21.0	21.0	20.9	20.9	21.0	21.2	21.5	21.2	21.2	21.1	21.2	21.3	21.4	21.1	21.3	21.2	21.1	21.1	21.0
February	21.9	21.7	21.3	21.3	....	....	21.2	21.3	21.1	21.2	21.2	21.5	21.7	21.4	21.4	21.3	21.4	21.5	21.7	21.3	21.5	21.5	21.4	21.4	21.2
March	22.1	21.9	21.5	21.5	....	....	21.3	21.5	21.4	21.4	21.4	21.7	21.9	21.6	21.6	21.5	21.6	21.7	21.9	21.6	21.7	21.7	21.6	21.6	21.5
April	22.3	22.1	21.7	21.7	....	....	21.5	21.7	21.5	21.5	21.6	21.9	22.1	21.7	21.8	21.7	21.8	21.9	22.0	21.7	22.0	21.9	21.8	21.8	21.7
May	22.4	22.3	21.9	21.8	....	....	21.7	21.8	21.7	21.8	21.8	22.1	22.3	21.9	22.0	21.9	22.0	22.0	22.2	21.8	22.2	22.1	22.0	21.9	21.9
June	22.6	22.5	22.1	22.0	....	....	21.9	22.0	21.9	22.0	22.0	22.3	22.5	22.1	22.2	22.1	22.2	22.3	22.4	22.1	22.4	22.3	22.2	22.1	22.1
July	22.8	22.6	22.3	22.2	....	....	22.1	22.2	22.1	22.2	22.1	22.5	22.7	22.3	22.3	22.2	22.3	22.5	22.6	22.3	22.5	22.4	22.3	22.3	22.3
August	....	....	....	....	....	....	22.3	22.4	22.3	22.4	22.3	22.7	22.9	22.5	22.5	22.4	22.5	32.7	22.8	22.5	22.7	22.6	22.5	22.5	22.4

* Holiday.

SEPT. 13. With trading practically at a standstill and fluctuations in a narrow range of about 10 points on the down side, no definite trend was seen. The general feeling is that stocks are not normally high and as the manufacturers' demand for actuals picks up in the late fall, prices will improve. Few bearish traders for the long pull can be found, and many are picking up contracts for next year positions on all declines from present levels, Sept., 19.80; Oct., 20.10; Nov., 20.50; Dec., 20.90; Jan., 21.10; Feb., 21.30; Mar., 21.50; Apr., 21.70; May, 21.90; June, 22.10; July, 22.20; Aug., 22.40.

SEPT. 14. This was another dead Saturday with little trading and both buyers and traders about equally divided. The market closed practically unchanged from Friday's closing prices.

SEPT. 16. With firmness in London and high cable offers from the Far East, prices opened higher and showed a strong underlying tone. Although trading was dull, prices advanced 10 to 20 points and the closing bids were on top prices. Buyers and sellers were about evenly distributed. Some switching was done, buying Sept. and selling Dec. at 120 points difference. Sept., 19.90; Oct., 20.40; Nov., 20.80; Dec., 21.10; Jan. 21.30; Mar., 21.70; Apr. 21.90; May, 22.00; June, 22.30; July, 22.50; Aug., 22.70.

SEPT. 17. Continued strength and more bullish activities appeared in trading, and although it was easier to sell rubber than buy, there was no real excitement and prices advanced 10 to 20 points. Some traders were sellers on the advance, but good support was noticeable on any minor decline. The attitude of the floor traders is one of confidence in the market, and little is heard of bears or short sellers these days. Prices closed at the highs. Sept., 20.10; Oct., 20.50; Nov., 20.90; Dec., 21.30; Jan. 21.40; Mar., 21.90; Apr., 22.00; May, 22.20; June, 22.40; July, 22.60; Aug., 22.80.

SEPT. 18. Lower London cables and acceptance of bids made last night stopped buying power, and prices declined, losing gains made the previous day. However, at the close there were large buying orders of 100 lots or more at closing prices, which gave the market a rather firm undertone. Trading during the day was in larger volume than previously. Sept., 19.80; Oct., 20.10; Nov., 20.50; Dec., 21.00; Jan., 21.20; Feb., 21.30; Mar., 21.60; Apr., 21.70; May, 21.80; June, 22.10; July, 22.30; Aug., 22.50.

SEPT. 19. London advanced 1/16 from yesterday, to 10 5/16 pence, which by the way is the same price that it was just a month ago. Trading was about 400 tons less than yesterday on the weak market, but advanced about 20 points with shorts covering and some trade buying. Towards the close there was good support with fairly large buying orders 10 points under closing prices. Sept., 19.90; Oct., 20.30; Nov., 20.70; Dec., 21.10; Jan., 21.30; Feb., 21.50; Mar., 21.70; Apr., 22.00; May, 22.20; June, 22.40; July, 22.50; Aug., 22.70.

SEPT. 20. Although there was a good deal of bearish talk with operators mulling over tire inventory reports and expected increases of stocks in London and Liverpool, the market was quiet, about 500 tons changing hands. Prices backed and filled in a narrow range; while the bears tried to depress prices, their offers were easily absorbed. Prices closed very steady with no declines. Sept., 18.90; Oct., 20.30; Nov., 20.80; Dec., 21.10; Jan., 21.20; Feb., 21.50; Mar., 21.70; Apr., 21.90; May, 22.10; June, 22.30; July, 22.40; Aug., 22.60.

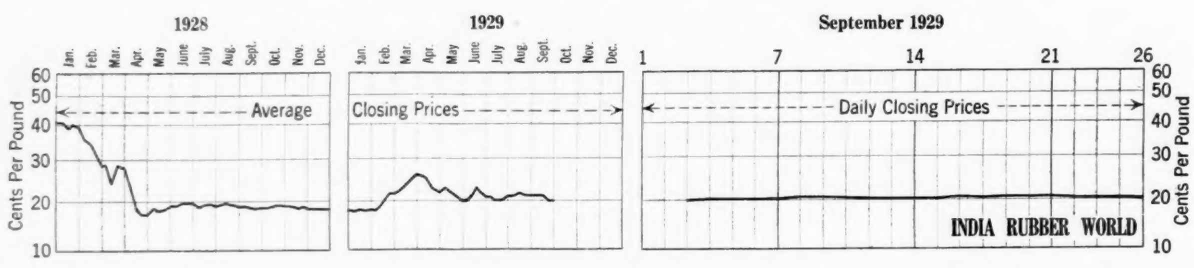
SEPT. 21. Trading, about equally divided between buyers and sellers, was of the usual Saturday aspect. Prices, with no definite trend, closed about 10 points lower. Sept., 19.80; Oct., 20.20; Nov., 20.70; Dec., 21.00; Jan., 21.10; Feb., 21.40; Mar., 21.60; Apr., 21.80; May, 22.00; June, 22.20; July, 22.30; Aug., 22.50.

SEPT. 23. With London fluctuating 1/16 under the previous close and with no real buying support, prices backed and filled in a narrow range. Some sold on the bearish news of curtailment in auto production and rumors of a tire cut. Yet it was noticeable that there was good buying support about 10 points under the market at all times. Prices finally closed off about 20 points, but with good buyers at closing prices. The market is very dull, and no desire to take on heavy commitments in either direction is evident. Sept., 19.60; Oct., 20.00; Nov., 20.50; Dec., 20.90; Jan., 21.10; Feb., 21.40; Mar., 21.60; Apr. 21.80; May, 21.90; June, 22.10; July, 22.30; Aug., 22.50.

SEPT. 24. London cables were unchanged, and another mixed market was seen on the Exchange, buyers and sellers being 10 points apart all day. Yet there was enough support to hold the market fairly steady. Prices were 10 points lower than yesterday, but the market could not be considered weak. There were fair-sized bids at the close. Sept., 19.60; Oct., 19.90; Nov., 20.40; Dec., 20.90; Jan., 21.00; Feb., 21.20; Mar., 21.50; Apr., 21.70; May, 21.90; June, 22.10; July, 22.30; Aug., 22.40.

SEPT. 25. London came over 1/8 lower and naturally exchange prices sagged on opening bids. Sales were made 20 points under the previous close, but at these levels enough buying support came in to hold prices. There was a fair trade with prices closing about 20 points off for the day. Sentiment is very mixed with many traders looking for a fair-sized rally later in the year. Sept., 19.56; Oct., 1980; Nov., 20.20; Dec., 20.60; Jan., 20.80; Feb., 21.00; Mar., 21.20; Apr., 21.40; May, 21.70; June, 21.80; July, 22.10; Aug., 22.20.

New York Outside Market—Spot Closing Prices Ribbed Smoked Sheets



New York Outside Market—Spot Closing Rubber Prices—Cents Per Pound

	August, 1929						September, 1929																	
PLANTATIONS	26	27	28	29	30	31*	2*	3	4	5	6	7	9	10	11	12	13	14	16	17	18	19	20	21
Sheet																								
Ribbed smoked	20¼	20½	20½	20¼	20¼	....	....	20	20⅛	20⅛	20⅛	20⅛	20½	20½	20¼	20⅛	20⅛	20⅛	20⅛	20½	20¼	20⅜	20⅜	20½
Crepe																								
First latex	21¼	21½	21½	21¼	21¼	....	....	21⅛	21	21	21	21	21⅜	21⅜	21⅛	21⅛	21⅛	21⅛	21⅛	21⅜	21¼	21¼	21⅜	21⅜
"B" blanket	17½	17¾	17¾	17½	17⅝	....	....	17⅝	17⅝	17½	17⅜	17⅜	18	17⅞	17⅝	17½	17½	17½	17½	17¾	17⅝	17¾	17⅞	17⅞
"C" blanket	17¼	17½	17½	17¼	17¼	....	....	17⅜	17⅜	17¼	17⅛	17⅛	17⅝	17½	17¼	17¼	17¼	17¼	17¼	17½	17⅜	17⅜	17⅝	17⅝
"D" blanket	16⅝	16⅞	16⅞	16½	16½	....	....	16⅝	16⅞	16⅝	16⅝	16⅝	17	17	16¾	16⅝	16⅝	16⅝	16⅝	16⅞	16¾	16¾	17	17
No. 2 brown	17⅛	17⅜	17⅜	17¼	17¼	....	....	17¼	17¼	17⅛	17	17	17½	17½	17⅛	17⅛	17⅛	17⅛	17⅛	17⅜	17⅜	17¼	17⅝	17⅝
Rolled brown	12⅝	12⅞	12⅝	12⅜	12½	....	....	12⅜	12½	12½	12⅜	12⅜	12¾	12⅞	12⅝	12¼	12¼	12¼	12¼	12½	12½	12½	12¾	12¾
Off latex	20¾	21⅛	21⅛	20¾	20¾	....	....	20⅝	20½	20½	20½	20½	20⅞	20⅞	20⅝	20⅝	20⅝	20⅝	20⅝	21	20¾	20¾	20¾	20¾

*Holiday

New York Outside Market

SEPT. 3. There was no incentive for manufacturers to buy after the holidays. Prices were about ⅛ to ¼ lower than last Friday; yet dealers were not inclined to cut prices to do business. The Malayan shipments for August, about 50,441 tons, was a bit larger than expected and this fact made buyers very cautious and more ready to play a watchful waiting game for the moment.

Spot	Today	Month Ago	Year Ago
Crepe	21¼	22½	19⅜
Ribs	20⅛	21⅛	19
Upriver fine	20¾	22	21

SEPT. 4. The consular invoice figures showing shipments of 37,276 tons for August were favorably received and although not very bullish, indicated that there is not so much rubber being shipped as is being consumed. There is enough rubber, however, available at present for immediate needs, and factories are quietly taking liberal quantities and have been meeting asking prices. Shipment offers were light and slightly above a workable basis. The market stiffened about ⅛-cent.

Spot	Today	Month Ago	Year Ago
Crepe	21¼	22⅛	19¼
Ribs	20¼	21	18¾
Upriver fine	20¾	22	21

SEPT. 5. Factories were in the market for crepe ribs and brown and quietly picked up reasonable offers. They were not chasing high offers and only bought when their bids were met. Offerings from the East were slightly out of line, but dealers would not meet them and sent out bids at lower prices to cover sales made during the day. The market showed signs of strength due to the feeling that when the factories buy Nov.-Dec. rubber, which must be soon, prices ought to stiffen. Sales were about ⅛ under previous close.

Spot	Today	Month Ago	Year Ago
Crepe	21⅛	22⅜	19¼
Ribs	20⅛	21	18⅝
Upriver fine	20½	22	21

SEPT. 6. Reports of a good demand for spot and Oct. rubber from Pacific Coast factories caused prices to hold very steady. Eastern manufacturers were also showing more interest. Shipment offers were very light with eastern holders reserved and not selling unless the asking price was obtained.

Spot	Today	Month Ago	Year Ago
Crepe	21¼	22¼	19
Ribs	20¼	21	18⅜
Upriver fine	20½	22	21

SEPT. 7. The usual quiet Saturday market was in evidence, with underlying strength, as dealers preferred not to offer rubber and only did so at a premium over market prices.

Spot	Today	Month Ago	Year Ago
Crepe	21¼	22¼	18⅝
Ribs	20½	20⅞	17⅞
Upriver fine	20½	21¾	21

SEPT. 9. With recoveries of 30 to 40 points on Exchange prices, dealers raised asking prices for actuals, and although an increase in London stocks of 1,800 tons was reported, yet eastern offers were high and a distinct change in sentiment was evident, dealers being buyers of shipment rubber rather than sellers to manufacturers. Prices advanced about ¼-cent on all grades and positions.

Spot	Today	Month Ago	Year Ago
Crepe	21½	20⅞	18⅝
Ribs	20½	20⅞	17⅞
Upriver fine	20½	21¾	21

SEPT. 10. Higher London cables together with a reduction of 3,000 tons in far eastern dealers' stocks made a firmer market, and Exchange prices advanced 20 to 40 points higher. This strength resulted in dealers marking up selling prices of actuals. Shipment offers were light and firmly held. American manufacturers were buyers in Singapore and London markets. Numerous local bids were made by manufacturers but they were not good enough and dealers only took bids in line with what they could replace. All grades and positions advanced about ⅛- to ¼-cent.

Spot	Today	Month Ago	Year Ago
Crepe	21⅝	20⅝	18⅛
Ribs	20⅝	20¾	18⅛
Upriver fine	21	21½	21

SEPT. 11. Higher invoiced rubber reports for the week ended Sept. 7 of nearly 4,000 tons had a depressing influence on the market and where it was strong yesterday, it was weak today. Bids made last night for shipment rubber were all accepted and this caused dealers to hold

New York Quotations

Following are the New York outside market rubber quotations for one year ago, one month ago, and September 26, the current date

Plantation Hevea	September 25, 1928	August 27, 1929	September 26, 1929
Rubber latex (Hevea)...gal.	$1.40 @	$1.50 @	$1.50 @
CREPE			
First latex, spot	.19 @.19¼	.21⅝@	.21⅛@.21¼
September	.19 @.19¼	.21⅝@	.21⅛@.21¼
October-December	.19¼@	.22¼@	.21⅝@.21¾
January-March	.18¾@.19	.23 @	.22 @.22½
April-June	.18½@	.23½@	.22¾@.23
Off latex, spot	.19 @	.21⅜@	.20¾@.21
"B" Blanket, spot	.18 @.18¼	.18 @	.17½@.17¾
September	.18 @	.18 @	.17½@.17¾
October-December	.18 @	.18¼@	.17⅞@.18
January-March	.17¾@	.18¾@	.18 @.18¼
April-June	.17⅝@	.19⅛@	.18½@.19
"C" Blanket, spot	.17¾@.18	.17¾@	.17¼@.17⅜
Brown No. 1	.17½@	.17½@	.17½@.17¾
Brown No. 2	.17¼@	.17 @	.17¼@.17½
Brown, roll*	.17 @	.12½@	.12½@
Sheet			
Ribbed, smoked spot	.18 @.18⅛	.20⅝@	.20⅛@.20¼
September	.18⅛@	.20⅝@	.20⅛@.20¼
October-December	.18⅛@	.21⅜@	.20¾@.20⅞
January-March	.18¼@.18⅜	.22 @	.21½@
April-June	.18¼@.18⅜	.22½@	.21⅞@.22
East Indian			
PONTIANAK			
Banjermasin	.09 @	.10 @	.08 @.09
Pressed block	.14 @	.16 @.17	.15 @.16
Sarawak	@	.10 @	@
South American			
PARAS			
Upriver, fine	.19 @	.21 @	.20½@
Upriver, fine	*.24 @	*.27 @	*.25 @
Upriver, coarse	.13½@	.11¼@	.10¾@
Upriver, coarse	*.19¾@	*.18½@	*.16½@
Islands, fine	@	.19¼@	.18¾@
Islands, fine	*.23½@	*.26¾@	*.24¾@
Acre, Bolivian, fine	.19½@	.21½@	.20¾@
Acre, Bolivian, fine	*.24 @	*.27¼@	*.25¼@
Beni, Bolivian	.20 @	.21¾@	.21 @
Madeira, fine	.19¼@	.21¼@	.20½@

South American	September 25, 1928	August 27, 1929	September 26, 1929
PARAS—*Continued*			
Peruvian, fine	$0.18¾@	$0.19½@	$0.19 @
Tapajos, fine	.18¼@	.19½@	.19 @
CAUCHO			
Upper caucho ball	.12½@	.11¼@	.10¾@
Upper caucho ball	*.19¾@	*.18½@	*.16½@
Lower caucho ball	.12 @	.10¾@	.10 @
Maniçobas			
Ceará negro heads	†.17 @	@	†.20 @
Ceará scrap	†.09 @	@	†.12 @
Manicoba, 30% guaranteed	†.19 @	@	†.22 @
Mangabiera, thin sheet	†.19 @	@	†.22 @
Centrals			
Central scrap	.14½@	.10½@	.10 @.10½
Central wet sheet	.12 @	@	@
Corintó scrap	.14½@	.10½@	.10 @.10½
Esmeralda sausage	.14½@	.10½@	.10 @.10½
Guayule			
Duro, washed and dried	.18½@	.19 @	.19 @
Ampar	.19½@	.20 @	.20½@
Gutta Percha			
Gutta Siak	.19 @	.21½@	†.19¾@
Gutta Soh	.30 @	.29 @ .30	@
Red Macassar	3.00 @	2.50 @2.60	2.35 @
Balata			
Block, Ciudad Bolivar	.43 @	.52 @	†.51 @
Colombia	.48 @	.47 @	†.49 @
Manaos block	.44 @	.59 @	.57 @.59
Panama	.48 @	@	@
Surinam sheet	.46 @	.56 @	.54 @.56
Amber	.49 @	.57 @	.56 @.58
Chicle			
Honduras	‡.68 @	‡.68 @	‡.60 @
Yucatan, fine	‡.68 @	‡.68 @	‡.60 @

*Washed and dried crepe. Shipment from Brazil.
†Nominal. ‡Duty paid.

back on further purchases to see what the next trend would be. American factories were reported buyers in London and Singapore. There was a small factory buying interest from Akron and New England. Prices closed off ¼- to ½-cent.

Spot	Today	Month Ago	Year Ago
Crepe	21¼	21⅞	19
Ribs	20⅜	20⅞	18½
Upriver fine.......	21	21¼	19½

SEPT. 12. With a little of the bearish tone lost on the Exchange and with firmer foreign markets and offers, dealers were less inclined to meet bids. Although factories took some nearby ribs at 20¼ and crepe at 21¼, they were not anxious and would not buy if dealers raised their ideas. The market might be called steadier yet not higher.

Spot	Today	Month Ago	Year Ago
Crepe	21¼	21⅞	19
Ribs	20⅜	20⅞	18½
Upriver fine.......	21	21¼	19½

SEPT. 13. The day had a quiet steady market in which manufacturers bought fair quantities of Nov. ribs at 20¾ cents and Dec. at 21 cents. Crepe was scarce and held at 21¼ for spot; several large buyers were picking it up continually. The manufacturers as a rule are waiting for prices under 20 cents, but an underlying strength prevents prices going below the 20-cent level. Eastern offers, although reasonable, are above a workable basis which makes dealers very cautious.

Spot	Today	Month Ago	Year Ago
Crepe	21¼	21⅝	19⅛
Ribs	20¼	20⅝	18½
Upriver fine.......	20¾	21⅝	19½

SEPT. 14. A usually dull Saturday market was noted. When factories made low bids, dealers as a rule refused to quote or asked too high prices to put over sales. Prices remained unchanged.

Spot	Today	Month Ago	Year Ago
Crepe	21¼	21⅝	19⅛
Ribs	20¼	20⅝	18½
Upriver fine........	20¾	21⅝	19½

SEPT. 16. With strong Singapore and London cables and strength on the Exchange, dealers advanced prices for actuals about ¼-cent all around. Factories were buyers but stopped quickly after obtaining small quantities, being unwilling to raise their ideas as dealers withdrew. Some traders were buyers; this tended to stiffen prices.

Spot	Today	Month Ago	Year Ago
Crepe	21½	21	19¼
Ribs	20⅝	19⅞	18½
Upriver fine	21	20⅝	19½

SEPT. 17. The market for actuals was very strong, although business with factories was limited as they seemed reluctant to follow up the advance with purchases. However, they bought a little, but bids were under the market. Some dealers were in the market, buying at a price, and they were bidders for large quantities at lower prices. One dealer who put out bids last night took on shipment rubber when offers came back ⅛ higher than his bid price. He considered himself lucky to obtain the rubber. Prices were ⅛ to ¼ higher.

Spot	Today	Month Ago	Year Ago
Crepe	21⅝	21	19¼
Ribs	20⅝	19⅞	18½
Upriver fine	21	20⅝	19½

SEPT. 18. Buyers of actuals seemed satisfied with purchases for the moment and a few sales of small quantities were reported. The Far East accepted all reasonable bids; this stopped dealers buying as they obtained what they wanted too easily. Prices closed steady at ¼- to ⅜-cent off for the day.

Spot	Today	Month Ago	Year Ago
Crepe	21¼	21⅜	19¼
Ribs	20⅝	20½	18½
Upriver fine	21	21	19½

SEPT. 19. With little better London cables and with dealers less inclined to sell and meet bids, prices for actuals stiffened a bit. Factories, however, would not follow the rise after they had got some cheap rubber yesterday; this caused a steady but dull market. Prices remained steady at the close.

Spot	Today	Month Ago	Year Ago
Crepe	21⅜	21	19¼
Ribs	20⅜	19⅞	18½
Upriver fine	21	20⅝	19½

SEPT. 20. A fair business in actuals saw factories taking on rather larger quantities than usual, Oct.-Dec. and Jan.-Mar. positions showing the most interest. Brown crepes were also in demand with the nearby positions showing the best buying interest. Prices, however, were undisturbed by the buying. Dealers would not cut to meet bids; so factories paid the asking prices.

Spot	Today	Month Ago	Year Ago
Crepe	21⅜	20⅜	18¼
Ribs	20⅜	20¼	20¼
Upriver fine	21	20⅝	19½

SEPT. 21. After the interest in buying yesterday factories remained out of the market. The usual dull trading resulted. Dealers preferred to await further offers from the East before making purchases or sales. Prices remained steady and unchanged at yesterday's close.

SEPT. 23. The slightly easier London cables and the more plentiful offerings of shipment rubber did not help prices for actuals. Factories picked up a little spot at ¼-cent lower than yesterday and withdrew when their actual needs were satisfied. No inquiries for future shipments were in the market. With foreign shipment offers pressing, dealers also held off, awaiting the next trend.

Spot	Today	Month Ago	Year Ago
Crepe	21⅛	21⅜	19¾
Ribs	20⅛	20⅜	19⅝
Upriver fine	21	21	21¾

SEPT. 24. Exchange prices were a trifle lower and dealers loath to cut prices for actuals, especially as foreign shipment offers were out of line with exchange prices. Prices held at yesterday's figures, and little business was reported. Some factory bids were made at low figures for spot and nearby, but these bids were not accepted. The market closed quiet.

Spot	Today	Month Ago	Year Ago
Crepe	21⅛	21⅜	19¾
Ribs	20⅛	20⅜	19⅝
Upriver fine	21	21	21¾

SEPT. 25. Foreign offers were a little more in line with New York prices, and dealers took on small quantities when they could get sellers to meet their ideas. However, they were not eager buyers as manufacturers were standing by, waiting further developments, and with enough rubber for their requirements until the turn of the month. Prices unchanged.

Rubber Afloat to the United States

All figures in long tons.

Week Ended	British Malaya	Ceylon	Netherland East Indies	London and Liverpool	Total
Aug. 31..	5,408	657	1,338	3	7,406
Sept. 7..	8,313	1,691	1,256	38	11,298
Sept. 14..	7,318	1,080	1,674	37	10,109
Sept. 21..	7,514	533	1,549	15	9,611

Election of Officers

The following nominations for officers of the Rubber Exchange of New York, Inc., will be voted on at the annual election on October 15.

President, Francis R. Henderson; vice president, Charles T. Wilson; treasurer, J. Chester Cuppia; members of the board of governors, Harold L. Bache, William E. Bruyn, James T. Bryan, Herbert S. DeLanie, J. Frank Dunbar, Jr., John L. Handy, John L. Julian, David S. Kubie, Jerome Lewine, Fred Pusinelli, William H. Stiles, and Edward J. Wade; inspectors of election, William D. Paul, Frank D. Pressinger, and Bradford P. Burleigh.

Price Differentials on Rubber Grades

The adjustment committee of the Rubber Exchange of New York on September 19, announced price differentials between the various grades of hevea plantation rubber which shall prevail on all Exchange deliveries during October as follows:

"A" Contracts. Off quality first latex crepe, one-tenth cent per pound; good F.A.Q. ribbed smoked sheets, one-half cent per pound; ordinary F.A.Q. ribbed smoked sheets, one and four-tenths cent.

"BB" Contracts. "D" blanket crepe, three-quarters cent per pound; "C" blanket crepe, one-quarter cent per pound; No. 1 brown crepe at contract price; No. 2 brown crepe, one-quarter cent per pound.

The committee also fixed the following limits of allowance on the two lowest grades deliverable against the "BB" contract at one-half cent per pound for "D" blanket crepe and one-quarter cent for No. 2 brown crepe.

Rubber Consumption Estimates

Basing their estimates on current operations at tire factories, members of the Rubber Exchange, on September 19, placed consumption of crude rubber during September at between 35,000 and 36,000 tons. This would represent a decline of approximately 2,500 to 3,000 tons from the August consumption rate as well as from September last year.

In only one instance, during 1924, has consumption of rubber in the United States shown an increase over August.

Consumption for the nine months of the year will establish a new high record amounting to 385,108 long tons, as compared with 331,787 for the corresponding period last year, and with 291,953 tons for the first nine months of 1927.

Reclaimed Rubber

THE moderate pace at which the tire-manufacturing section of the industry has been proceeding for the past two months resulted in a corresponding reduction of the reclaimed rubber output. However, the reclaiming plants have been engaged on somewhat less than full production and are shipping steadily to fill the routine demands of manufacturers.

Since the excessive tire inventories have been heavily reduced in the past two months, reclaimers are hopefully expecting that 24-hour plant operation will be called for soon to meet the fall and winter requirements of manufacturers.

Current prices have been reduced on black and selected auto tires from ¼- to ½-cent a pound; on dark gray, 1 cent; on light gray, 2 cents; and on white, ½-cent.

Miscellaneous grades of red and mechanical blends have suffered a reduction of ½- to ¾-cent. Prices remain unchanged from one month ago on shoe, tube, and truck tire qualities.

New York Quotations

September 26, 1929

High Tensile	Spec. Grav.	Price Per Pound
Super-reclaim, black	1.20	$0.12¼ @ $0.12½
red	1.20	.11½ @ .12
Auto Tire		
Black	1.21	.07¼ @ .07½
Black selected tires	1.18	.07½ @ .08
Dark gray	1.35	.09 @ .10
Light gray	1.38	.10 @ .11
White	1.40	.12 @ .12½
Shoe		
Unwashed	1.60	.07 @ .07¼
Washed	1.50	.09¾ @ .10
Tube		
No. 1	1.00	.13 @ .13½
No. 2	1.10	.10¼ @ .10½
Truck Tire		
Truck tire, heavy gravity	1.55	.07 @ .07¼
Truck tire, light gravity	1.40	.07¼ @ .07½
Miscellaneous		
Red	1.35	.12¼ @ .12¾
Mechanical blends	1.60	.07 @ .07½

Rubber Scrap

THE rubber scrap market is correspondingly quiet with that of reclaim, although for certain grades, notably air-brake hose, the general run of auto tire grades and inner tubes, the demand is fair to active.

Eight price changes are noted from the quotations of one month ago. Without exceptions the revisions are upward but are only slight in amount.

BOOTS AND SHOES. The demand is quiet. Black grade has advanced ⅓-cent a pound.

HARD RUBBER. The market is inactive and prices unchanged.

MECHANICALS. The demand is dull on all grades with prices unchanged except in the case of air-brake hose, the demand for which is good.

TIRES. All grades of auto tires are in active movement. Mixed auto tires with beads have advanced 50 cents a ton. Mixed auto peelings have moved up $1 a ton. There is a scant supply of white tires, very few of which have been made in the past ten years.

INNER TUBES. No. 1 floating tubes are in good demand but the supply is short because relatively few are made, the main output being superior compounded gray and red tubes. The different qualities of compounded tubes are active. Red tubes advanced ¼-cent and mixed tubes ⅛-cent.

CONSUMERS' BUYING PRICES

Carload Lots

September 26, 1929

Boots and Shoes		Prices
Boots and shoes, black	*lb.*	$0.0145 @ $0.0155
Untrimmed arctics	*lb.*	.00¾ @ .01
Tennis shoes and soles	*lb.*	.00¾ @
Hard Rubber		
No. 1 hard rubber	*lb.*	$0.08 @ $0.08½
Mechanicals		
Mixed black scrap	*lb.*	.00½ @ .00⅝
Hose, air brake	*ton*	24.00 @ 26.00
regular soft	*lb.*	.00⅝ @
No. 1 red	*lb.*	.02 @ .02¼
No. 2 red	*lb.*	.01 @ .01½
White druggists' sundries	*lb.*	.02 @ .02½
Mechanical	*lb.*	.01½ @ .01⅝
Tires		
Pneumatic Standard—		
Mixed auto tires with beads	*ton*	24.50 @ 25.00
Beadless	*ton*	32.50 @ 33.50
White auto tires with beads	*ton*	40.00 @ 42.00
Beadless	*ton*	48.00 @ 49.00
Mixed auto peeling	*ton*	36.00 @ 38.00
Solid—		
Mixed motor truck, clean	*ton*	22.00 @ 23.00
Inner Tubes		
No. 1, floating	*lb.*	0.07¼ @ 0.07½
No. 2, compounded	*lb.*	.04¼ @ .04⅜
Red	*lb.*	.05 @ .05⅛
Mixed tubes	*lb.*	.04½ @ .04⅝

Industry and Trade

From Report of the National Industrial Conference Board

Automobiles

THE August output of passenger cars and trucks was estimated at 515,000, being the eighth consecutive month this year to surpass corresponding months of all previous years but continued the gradual seasonal decline from the peak reached in April. The production in August was 0.5 per cent under July, but 4.5 per cent over the record month of August last year. July new registrations in the United States and foreign sales reached 581,893 units as compared with the July output of 517,792. During the first seven months of this year production increased 43 per cent, while domestic registrations and foreign sales gained 42 per cent as compared with the corresponding period in 1928. Truck sales and output reflected a rate of increase double that of passenger cars during the January-July period.

Crude Rubber

Consumption of crude rubber in August amounted to 38,274 tons, a decrease of 8 per cent as compared with July. The cumulative consumption for the first eight months of this year showed an increase of 20 per cent over the same period of 1928. Last month imports of crude rubber equaled consumption but declined 13 per cent under the July imports. Preliminary figures available showed a reduction in inventories of tires and tubes as of August 31 as well as a substantial increase in the shipments of these commodities during the month.

Cotton

Consumption of raw cotton by American mills during August amounted to 558,000 bales compared with 527,000 bales in August of last year. This is the largest quantity consumed in any preceding August since the war except August, 1927, when the amount was 633,000 bales.

Consumption of crude oil established a new high record of 88,315,000 barrels during July, an increase of 4 per cent over the preceding month and 5 per cent over July, 1928. Gasoline production and consumption also reached new high levels, while stocks decreased 4,111,000 barrels during the month. Another fact of interest is the increase of 15 per cent in gasoline consumption during the first seven months of this year compared with the corresponding period of 1928.

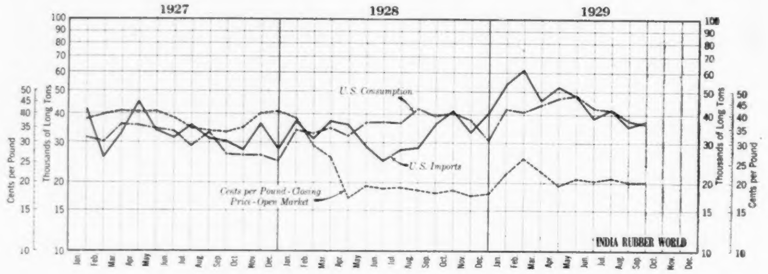
Merchandise Sales

Retail demand, shown by department-store and chain-store sales, is greater than last year. Department-store sales in August increased 5 per cent over the same month a year ago, but the increase varied considerably in different geographical regions. Reporting chain stores showed an average increase of 32 per cent over August a year ago and a gain of 28 per cent in the first eight months of this year compared with the same period last year, without correction for any growth due to the number of distributive units. For a number of past years department-store sales have expanded from August to September.

Imports, Consumption, and Stocks

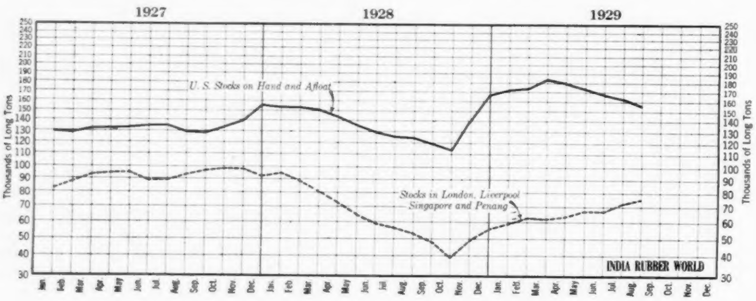
THE graph of imports and consumption is newly charted from official United States statistics by months for the years 1927 and 1928 and for January to August, 1929. September imports and consumption are unofficial estimates from New York sources. The price graph represents official closing prices of the Rubber Trade Association of New York for spot ribbed smoked sheet rubber.

The corrected imports for August totaled 35,800 tons or 2,200 tons less than estimated. The corrected consumption for August was 2,854 tons more than estimated. September imports are estimated at 37,500 tons and consumption at 36,000 tons.



United States Imports, Consumption, and Prices of Ribbed Smoked Sheets

Average prices for spot ribbed smoked sheet rubber are charted by monthly intervals with imports and consumption from January, 1927, to September, 1929.



Rubber Stocks in United States, England, and Far East

On the second graph are shown two curves; one represents United States stocks. These are the monthly totals of stocks on hand and afloat to the United States. The other curve represents the total of stocks in London, Liverpool, Singapore, and Penang at the close of each month.

London stocks from August 31 to September 21 inclusive advanced to the highest level thus far this year. The weekly record was as follows: August 31, 35,605 tons; September 6, 36,620 tons; September 14, 37,901 tons; September 21, 40,151 tons.

Liverpool stocks on the same dates were: August 31, 7,560 tons; September 6, 8,351 tons; September 14, 8,660 tons; September 21, 9,780 tons.

United States Statistics of Rubber Imports, Consumption, and Stocks

	*Net Imports Tons	†Consumption Tons	‡Stocks on Hand Tons	§Stocks Afloat Tons	Total Domestic Stocks Tons	Foreign Stocks: *London & Liverpool Tons	Foreign Stocks: *Singapore & Penang Tons	Total Foreign Stocks Tons
Twelve Months								
1925	385,596	388,000	[illegible]	52,421	103,406	6,328	18,840	25,168
1926	399,972	366,000	72,510	51,238	123,748	51,320	26,443	77,763
1927	403,472	373,000	102,982	51,938	154,920	66,261	25,798	92,059
1928	407,572	437,000	73,554	92,837	166,391	22,603	32,905	55,508
1927								
January	42,107	31,694	82,923	47,020	129,943	57,065	25,440	82,505
February	26,312	30,306	78,929	48,542	127,471	61,170	26,766	87,936
March	33,207	36,343	75,793	55,561	131,354	65,634	27,843	93,477
April	45,118	36,073	84,838	47,010	131,848	69,798	24,543	94,341
May	34,135	34,787	84,186	48,531	132,717	70,099	25,133	95,232
June	31,695	33,991	81,890	52,280	134,170	66,887	21,898	88,785
July	36,116	29,383	88,623	45,664	134,287	66,776	22,568	89,344
August	31,349	33,647	86,325	42,745	129,070	67,836	25,764	93,600
September	30,264	27,367	89,222	38,230	127,452	71,505	25,178	96,683
October	28,126	26,942	90,406	42,292	132,698	72,584	25,790	98,374
November	36,619	26,943	100,082	39,517	139,599	69,896	28,369	98,265
December	28,424	25,524	102,982	51,938	154,920	66,261	25,798	92,059
1928								
January	37,552	34,065	106,469	46,441	152,910	68,660	25,868	94,528
February	31,415	33,370	104,514	48,044	152,558	65,307	22,867	88,174
March	37,468	35,335	106,647	43,378	150,025	60,405	20,538	80,943
April	36,175	32,450	110,372	32,783	143,155	55,910	16,946	72,856
May	29,112	36,965	102,519	33,145	135,664	46,882	17,687	64,569
June	25,567	37,305	90,781	38,392	129,173	41,091	18,207	59,298
July	28,362	37,040	82,103	42,943	125,046	37,818	18,663	56,481
August	28,827	42,505	68,425	54,904	123,329	34,364	18,971	53,335
September	36,800	39,490	65,735	52,692	118,427	33,673	14,898	48,571
October	41,667	40,455	66,947	45,646	112,593	26,600	12,149	38,749
November	33,846	37,095	63,698	75,502	139,200	19,988	29,188	49,176
December	40,781	30,925	73,554	92,037	165,591	22,603	32,905	55,508
1929								
January	53,992	42,530	84,946	92,480	177,426	28,966	29,617	58,583
February	61,331	41,137	105,140	74,891	180,031	29,659	32,373	62,032
March	46,391	44,238	107,293	75,848	183,141	32,540	29,437	61,977
April	52,520	47,000	112,813	66,119	178,932	35,958	27,339	63,297
May	48,475	48,692	112,596	59,526	172,122	35,828	31,932	67,760
June	38,821	42,753	108,664	57,948	166,612	35,575	31,861	67,436
July	41,114	41,069	108,709	52,078	160,787	35,599	35,473	71,072
August	35,800‡	37,854	106,655‡	48,434	155,089‡	43,165	33,124	76,289‡

*Official statistics. †Census Bureau figure 1925, Rubber Division survey figures other years; Rubber Manufacturers Association figures raised (from estimated 91 per cent) for months of 1929. ‡R. M. A. figures 1925 and 1926, calculated on basis of consumption and net imports thereafter. §R. M. A. figures 1925, calculated on basis official "rubber invoiced" statistics thereafter. ‡Provisional figure.

Compiled by Rubber Division, Department of Commerce, Washington, D. C.

Compounding Ingredients

THE seasonal reduction of about 20 per cent in tire production for July and August permitted a reduction of the tire inventory by 2,000,000 or more units. Manufacturing schedules have again turned upward and are expected to increase rapidly in the last quarter with consequent improvement in the demand for rubber and compounding ingredients.

Apparently the country's capacity to turn out tires and tubes, like that of motor vehicle production, is much greater than that needed for domestic requirements, making necessary periodic readjustments of inventories and output.

ACCELERATORS. The list of available accelerators covering practically all qualities of goods and conditions of cure has not been added to in the past month. Those suited for low temperature cures are especially favored where available.

ANTIOXIDANTS. The various groups of antiagers, namely, preventives against oxidation, surface weathering, and cracking, and fatigue inhibitors are all in active demand to safeguard the life even of the more inexpensive qualities of rubber goods. As a result, the perishing of rubber goods, formerly a serious cause of loss to rubber goods' manufacturer and user, is now practically eliminated.

BENZOL. The balance between stocks and demand is reported to be very close. There will be a good fall output. Stocks are ample and prices firm.

CARBON BLACK. The demand by the rubber industry has been rather less than active for the past two months. Prices are firm and the outlook good for consumption in the coming quarter.

CLAY. This staple ingredient is obtainable in various grades, certain of which are very efficient as cheap reenforcers and diluents of rubber for abrasive wear service.

DEGRAS. This rubber softener is in fairly active demand in all its industrial applications including rubber work.

LITHARGE. In general industry the demand for litharge has been more active and is seasonally improving in the rubber trade. There seems to be renewed appreciation of litharge as an activator for certain organic vulcanization accelerators.

LITHOPONE. The demand holds steady at unchanged prices.

MINERAL RUBBER. This dependable favorite is in usual active demand at steady prices.

SOFTENERS. All qualities and types of softeners have become practically standard and in steady routine demand.

V. M. P. NAPHTHA. This principal solvent of the rubber industry is as usual in steady routine demand. Supplies are ample and prices steady.

STEARIC ACID. The market is firmer and demand good.

ZINC OXIDE. Prices firm and unchanged. Rubber trade demand routine.

New York Quotations

September 26, 1929

Accelerators, Inorganic

Lead, carbonate	lb.	$0.09	@	
Lead, red	lb.	.10¼	@	
sublimed white	lb.	.08½	@	
sublimed blue	lb.	.08½	@	
super-sublimed white lead	lb.	.08¾	@	
Lime, R. M. hydrated	ton	20.00	@	
Litharge	lb.	.09¼	@	
Magnesia, calcined heavy	ton	75.00	@	
Magnesia carbonate	lb.	.08¾	@	.11
Orange mineral A.A.A.	lb.	.12¼	@	

Accelerators, Organic

A-7	lb.	.55	@	.65
A-11	lb.	.62	@	.75
A-16	lb.	.57	@	.65
A-19	lb.	.58	@	.75
A-20	lb.	.64	@	.80
A-32	lb.	.80	@	.95
Aldehyde ammonia	lb.	.65	@	.70
B. B.	lb.		@	
Butene	lb.	.78	@	
Captax	lb.		@	
Crylene	lb.	.50	@	.60
Paste	lb.	.40	@	.50
D. B. A.	lb.	2.00	@	
D. O. T. G.	lb.	.42	@	.44½
D. P. G.	lb.	.30	@	.32½
Ethylidineaniline	lb.	.45	@	.47½
Formaldehydeaniline	lb.	.37½	@	.42½
Grasselerator 102	lb.		@	
552	lb.		@	
808	lb.		@	
833	lb.		@	
Heptene	lb.	.38	@	.40
base	lb.	1.70	@	
Hexamethylenetetramine	lb.	.58½	@	.61
Lead oleate, No. 999	lb.	.16	@	
Witco	lb.	.14	@	
Lithex	lb.	.18	@	.20
Methylenedianiline	lb.		@	
Monex	lb.	3.25	@	
Plastone	lb.		@	
R-2	lb.	2.00	@	2.50
R. & H. 40	lb.	.40	@	.42½
50	lb.	.40	@	.42½
Safex	lb.	1.20	@	1.25
Super-sulphur, No. 1	lb.		@	
No. 2	lb.		@	
Tensilac No. 39	lb.		@	
No. 41	lb.		@	
Thermlo F	lb.	.50	@	.55
Thiocarbanilid	lb.	.23	@	.28½
Trimene	lb.	.75	@	
base	lb.	1.20	@	
Tuads	lb.		@	
V. G. B.	lb.	.60	@	
Waxene	lb.	.30	@	.40
ZBX	lb.	2.50	@	
Z-88	lb.	.50	@	.60
Zimate	lb.		@	

Acids

Acetic 28% (bbls.)	100 lbs.	3.88	@	4.13
glacial (carboys)	100 lbs.	14.18	@	14.43
Sulphuric, 66°	100 lbs.	1.60	@	

Alkalies

Caustic soda, solid	100 lbs.	3.00	@	3.25

Antioxidants

Age-Rite, powder	lb.		@	
resin	lb.		@	
white	lb.		@	
Albasan	lb.	.70	@	.75
Antox	lb.		@	
Grasselerager A	lb.		@	
Resistox	lb.	$0.54	@	$0.65
Stabilite	lb.	.62	@	
Sunproof	lb.	.35	@	.37½

Colors

BLACK				
Bone	lb.	.09½	@	
Carbon (see compounding ingredients)				
Drop (bbls.)	lb.	.05½	@	.15
Lampblack (commercial)	lb.	.07	@	.08
BLUE				
Akco blue	lb.	1.80	@	
Huber Brilliant	lb.	4.20	@	4.70
Prussian	lb.	.35	@	.55
Ultramarine	lb.	.20	@	
BROWN				
Huber Mocha	lb.	1.60	@	2.10
Sienna, Italian, raw	lb.	.05½	@	.12½
GREEN				
Akco green	lb.	2.60	@	
Chrome, light	lb.	.27	@	.31
medium	lb.	.28	@	.31
Huber Brilliant	lb.	4.35	@	
Chromium Oxide	lb.	.50	@	.55
ORANGE				
Huber Persian	lb.	.50	@	1 00
RED				
Akco red	lb.	2.75	@	
Antimony				
Crimson, 15/17%	lb.	.50	@	.55
Sulphur free	lb.	.55	@	.65
Crimson, R. M. P. No. 3	lb.	.48	@	
Sulphur, free	lb.	.52	@	
Vermilion, No. 5	lb.		@	
No. 15	lb.		@	
Golden	lb.		@	
No. 60	lb.		@	
15/17%	lb.	.21	@	.24
7-A	lb.	.35	@	
Z-2	lb.	.22	@	
Aristi	lb.	1.75	@	
Huber Brilliant	lb.	1.35	@	1.85
Iron Oxides				
bright pure domestic	lb.	.12	@	
bright pure English	lb.	.13	@	
bright reduced English	lb.	.10	@	
bright reduced domestic	lb.	.10	@	
Indian (maroon), pure domestic	lb.	.11	@	
Indian (maroon), pure English	lb.	.11	@	
Indian (maroon), reduced English	lb.	.09½	@	
Indian (maroon), reduced domestic	lb.	.08	@	
Oximony	lb.	.13¼	@	

Colors—(Continued)

RED—(Continued)				
Spanish red oxide	lb.	$0.03	@	$0.04¼
Sunburnt red	lb.	.14	@	
Venetian reds	lb.	.02	@	.06
WHITE				
Lithopone	lb.	.05½	@	.05¾
Albalith	lb.		@	
Azolith	lb.	.05¼	@	.05¾
Grasselli	lb.		@	
Sterling	lb.		@	
Vanolith	lb.	.05½	@	
Titanox	lb.	.08½	@	.09
Zinc Oxide				
AAA (lead free) (bbls.)	lb.	.07	@	
Azo (factory):				
ZZZ (lead free)	lb.	.06½	@	.07
ZZ (leaded)	lb.	.06¼	@	.06¾
Z (8% leaded)	lb.	.06¼	@	.06¾
Green seal	lb.		@	
Kadox	lb.		@	
Red seal	lb.		@	
Special	lb.		@	
White seal	lb.		@	
XX green label	lb.		@	
XX red label	lb.		@	
YELLOW				
Akco yellow	lb.	1.45	@	
Cadmium sulphide	lb.	1.00	@	1.40
Chrome	lb.	.17	@	.17½
Grasselli cadmium	lb.		@	
Huber canary	lb.	3.30	@	3.80
Ochre, domestic	lb.	.01¾	@	.02¾
Ochre, French	lb.	.03	@	.05
Oxide, pure	lb.	.09	@	
Zinc, C. P., imported	lb.	.21	@	

Compounding Ingredients

Aluminum flake (sacks, c.l.)	ton	21.85	@	
(sacks l.c.l.)	ton	24.50	@	
Ammonium carb. pwd.	lb.	.10	@	.11
lump	lb.	.10	@	.11
Asbestine	ton	13.40	@	13.50
Barium, carbonate	lb.	.03	@	.03½
Baryta white (f.o.b. St. Louis, bbls.)	ton	23.00	@	
Baryta white (f. o. b. St. Louis, paper bags)	ton	22.20	@	
Barytes, pure white	ton	35.00	@	
off color	ton	27.50	@	
medium	ton	30.00	@	
Foam "A" (f. o. b. St. Louis, bbls.)	ton	23.00	@	
Foam "A" (f. o. b. St. Louis, bags)	ton	23.00	@	
Basofor	lb.	.04½	@	
Blanc fixe, dry	lb.	.04½	@	
pulp	ton	42.50	@	45.00
Carbon Black				
Aerfloted arrow	lb.	.07	@	.12
Century	lb.	6.60	@	
Compressed	lb.	.06½	@	.12
Disperso	lb.	6.60	@	
Fumonex	lb.	.06	@	.09
Gatex (f.o.b. fact'y contracts	lb.	.045	@	.0525
carload	lb.	.055	@	
l. c. l.	lb.	.08	@	
Micronex	lb.	.07	@	.12
Uncompressed	lb.	.06½	@	.11
Velvetex	lb.	.04½	@	.06

New York Quotations

September 26, 1929

Compounding Ingredients *(Continued)*

Carrara filler	ton	@
Chalk	ton	12.00 @
Clay, Blue Ridge, dark	ton	@
Blue Ridge, light	ton	@
China	lb.	.01¼ @
Dixie	ton	@
Langford	ton	@
Mineral flour (Florida)	ton	@
Perfection	ton	25.00 @
Suprex	ton	8.00 @ 20.00
Tensulite	ton	10.00 @ 22.00
Cotton flock, black	lb.	$0.13 @
light-colored	lb.	.10 @ .12
white	lb.	.12 @ .30
Glue, high grade	lb.	.25 @ .35
low grade	lb.	.16 @ .23
Infusorial earth	ton	45.00 @
Mica, amber	lb.	.04½ @
Neomepin, S. A. conc.	lb.	.60 @
Pumice stone, powd.	lb.	.02½ @ .04
Rottenstone, domestic	ton	23.50 @ 28.00
Shellac, fine orange	lb.	.60 @
Soapbark (cut)	lb.	.12 @ .12½
Soapstone	ton	15.00 @ 22.00
Talc, domestic	lb.	.01¼ @
French	ton	18.00 @ 22.00
Pyrax A	ton	@
B	ton	@
Thermatomic carbon	lb.	@
Whiting		
Domestic	100 lbs.	1.00 @
English, cliffstone	100 lbs.	1.50 @
Imported chalk	100 lbs.	.90 @ 1.00
Paris White, English cliffstone	100 lbs.	1.50 @ 2.50
Quaker	ton	@
Slate flour, gray (fact'y)	ton	7.00 @
Snow white	ton	@
Sussex	ton	@
Vancolloid	ton	@
Vansulite	ton	14.00 @
Westminster Brand	100 lbs.	@
Witco (l. c. l.) (f. o. b. New York)	ton	20.00 @

Factice—See Rubber Substitutes

Mineral Rubber

Fluxrite (solid)	lb.	$0.05½ @ $0.06½
Genasco (fact'y)	ton	50.00 @ 52.00
Gilsonite (fact'y)	ton	37.14 @ 39.65
Granulated M. R.	ton	@
Hydrocarbon, hard	ton	@
Hydrocarbon, soft	ton	@
Ohmlac Kapak, M. R. (f. o. b. factory)	ton	60.00 @
M-4 (f. o. b. fact'y)	ton	175.00 @

Mineral Rubber *(Continued)*

Paradura (fact'y)	ton	62.50 @ 65.00
Pioneer, M. R., solid (fact'y)	ton	40.00 @ 42.00
M. R. granulated	ton	50.00 @ 52.00
Robertson, M. R., solid (fact'y)	ton	34.00 @ 80.00
M. R. gran. (fact'y)	ton	38.00 @ 80.00
Vansul Puro	ton	24.00 @

Oils

Kerosene	gal.	$0.15 @
Mineral	gal.	.20 @
Poppy seed oil	gal.	1.50 @ 1.70
Rapeseed	gal.	.82 @
Red oil, distilled	lb.	.10⅝ @ .11⅛
Rubber process	gal.	.25 @
Spindle	gal.	.30 @

Rubber Substitutes or Factice

Black	lb.	.08 @ .14
Brown	lb.	.08 @ .15
White	lb.	.09 @ .16

Softeners

Burgundy pitch	100 lbs.	5.00 @ 6.00
Atlas	100 lbs.	6.50 @
Corn oil, crude	lb.	.10 @
Cottonseed oil	lb.	.10 @
Cycline oil	gal.	.26 @ .34
Degras	lb.	.03¼ @ .04¼
Fluxrite (fluid)	lb.	.05½ @ .06½
Moldrite	lb.	.07 @ .07½
Palm oil (Lagos)	lb.	.09 @
Palm oil (Niger)	lb.	.08½ @
Palm oil (Witco)	lb.	.10 @
Para-flux	gal.	.17 @
Petrolatum, snow white	lb.	.08⅛ @ .08⅝
Pigmentar	lb.	.038 @ .0446
Pigmentaroil (tank cars, factory)	gal.	.21 @
(bbls., drums)	gal.	.26 @
Pine oil, dest distilled	gal.	.55 @ .58
Pine tar (retort)	bbl.	11.50 @ 12.00
Rosin K (bbls.)	280 lbs.	9.75 @
Rosin oil, compounded	gal.	.32 @
No. 3, deodorized	gal.	.60 @
No. 556, deodorized	gal.	.51 @
Rubite	lb.	.10 @
Rubtack	lb.	.11 @
Stearex	lb.	.15 @ .19
Stearic acid, double pressed	lb.	.15½ @ .16
Tackol	lb.	.09 @ .15

Softeners *(Continued)*

Tasco W-S No. 1	lb.	@
A	lb.	@
Vansulol	lb.	.11½ @
Vantar (Pine Tar)	gal.	.35 @
Witco No. 20	gal.	.17 @
Woburn oil	lb.	.05½ @ .06

Solvents

Benzol (90% drums)	gal.	$0.28 @
Carbon bisulphide (drums)	lb.	.05½ @ .11
tetrachloride (drums)	lb.	.06½ @ .10
Cyclohexanonemethyl	lb.	.60 @
Dip-Sol	gal.	.13 @
Dryolene, No. 9	gal.	.10½ @
Gasoline		
No. 303		
Tankcars	gal.	.16 @
Drums, c. l.	gal.	.20 @
Drums, l. c. l.	gal.	@
Hexalin	lb.	.60 @
acetate	lb.	.70 @
Rub-Sol	gal.	.09 @
Solvent naphtha	gal.	.35 @
Stod-Sol	gal.	.10 @
Turpentine, Venice	lb.	.20 @
dest distilled	gal.	.40 @ .43

Vulcanizing Ingredients

Sulphur		
Velvet flour (240 lb. bbls.)	100 lbs.	@
(150 lb. bags)	100 lbs.	@
Soft rubber (c.l.)	100 lbs.	@
(l.c.l.)	100 lbs.	@
Superfine commercial flour (210 lb. bbls.)	100 lbs.	2.55 @ 3.10
(100 lb. bags)	100 lbs.	2.40 @ 2.80
Tire brand, superfine,	100 lbs.	1.90 @ 2.25
Tube brand, velvet	100 lbs.	2.40 @ 2.75
Sulphur chloride	lb.	.05 @ .07
Vandex (selenium)	lb.	@
(See also Colors—Antimony)		

Waxes

Beeswax, white, com.	lb.	.55 @
carnauba	lb.	.33 @
ceresine, white	lb.	.12½ @
montan	lb.	.07½ @
ozokerite, black	lb.	.28 @
green	lb.	.28 @
Paraffin		
122/124 crude, white scale	lb.	.03¼ @
124/126 crude, white scale	lb.	.03¼ @
123/125 fully refined	lb.	.04¼ @ .04⅜
125/127 fully refined	lb.	.04¼ @

Rims Approved by Tire & Rim Association

Rim Size	August, 1929		8 Months, 1929	
	Number	Per Cent	Number	Per Cent
Motorcycle				
24 x 3 "CC"	....	...	10,464	0.1
24 x 3 Std.	....	...	4,668	0.0
26 x 3 "CC"	....	...	1,971	0.0
26 x 3 Std.	....	...	1,035	0.0
28 x 3 "CC"	....	...	2,194	0.0
18 x 3 SS	4,392	0.3	18,492	0.1
19 x 3 SS	....	...	13,978	0.1
Clincher				
30 x 3½	40,585	2.6	211,055	1.2
31 x 4	....	...	765	0.0
18" Balloons				
18 x 4	102,059	6.5	1,097,747	6.2
18 x 3.25	10,930	0.7	96,049	0.5
18 x 4½	1,340	0.1	255,424	1.4
18 x 5	5,918	0.4	65,144	0.4
19" Balloons				
19 x 2.75	76,646	4.9	340,966	1.9
19 x 3½	22,836	1.5	519,392	2.9
[illegible]	[illegible]	18.4	[illegible]	19.1
19 x 3.25	40,827	2.6	247,343	1.4
19 x 4½	127,618	8.1	622,168	3.5
19 x 5	34,186	2.2	120,770	0.7
20" Balloons				
20 x 2.75	404,125	25.7	4,584,326	25.9
20 x 3½	2,838	0.2	69,342	0.4
20 x 4	18,035	1.1	1,486,515	8.4
20 x 4½	30,396	1.9	283,239	1.6
20 x 5	....	...	225,942	1.3
20 x 6	652	0.0	37,625	0.2
20 x 6.75	280	0.0	12,486	0.1
21" Balloons				
21 x 2.75	7,121	0.5	132,785	0.8
21 x 3½	58,636	3.7	256,549	1.4
21 x 4	2,876	0.2	54,315	0.3
21 x 4½	7,064	0.5	46,920	0.3
21 x 5	....	...	5,507	0.0
21 x 6	809	0.0	3,314	0.0
22" Balloons				
22 x 4	510	0.0	1,419	0.0
22 x 4½	614	0.0	1,515	0.0
High Pressure				
30 x 3½—23	3,636	0.2	26,339	0.1
31 x 4—23	....	...	1,086	0.0
32 x 4½—23	5,005	0.3	37,339	0.2
32 x 4—24	4,522	0.3	24,736	0.1
33 x 4½—24	....	...	98	0.0
32 x 3½—25	....	...	1,056	0.0
34 x 4½—25	399	0.0	3,377	0.0
20" Truck				
30 x 5	215,864	13.7	2,637,721	15.0
32 x 6	15,741	1.0	329,603	1.9
34 x 7	5,046	0.3	127,766	0.7
36 x 8	13,733	0.9	101,362	0.6
40 x 10	365	0.0	669	0.0
22" Truck				
36 x 7	70	0.0	3,021	0.0
38 x 8	1,323	0.1	10,049	0.1
24" Truck				
34 x 5	1,051	0.1	4,915	0.0
36 x 6	2,473	0.2	29,586	0.2
38 x 7	3,595	0.2	40,291	0.2
40 x 8	7,654	0.5	58,486	0.3
44 x 10	....	...	246	0.0
Airplane				
8 x 3	....	...	429	0.0
12 x 3	....	...	1,669	0.0
14 x 3	....	...	101	0.0
16 x 3	....	...	43	0.0
18 x 3	....	...	581	0.0
16 x 3½	....	...	3,007	0.0
20 x 3½	....	...	4,095	0.0
20 x 4	....	...	1,546	0.0
20 x 5	....	...	221	0.0
20 x 6	9	0.0	646	0.0
20 x 8	....	...	428	0.0
24 x 10	13	0.0	218	0.0
18 x 4 Clincher	....	...	7,730	0.0
Totals	1,570,099	...	17,668,727	...

Cotton and Fabrics

AMERICAN COTTON. The price of spot middling cotton on September 3 was 19.55 cents, compared with 19.20 cents on August 1. At the end of August unfavorable reports of crop conditions in the Southwest caused a rather sudden rise that culminated on the first business day of September with the highest price recorded for the month. By the close of the first week of September prices had receded to 19.15, to advance 20 points on the publication of the Crop Reporting Board's estimate, on Monday, September 9.

After a decline to 18.95 on Tuesday, prices sagged through the second week to close with an advance of 20 points to 19.00 on Saturday. The third week of September opened with a drop to 18.70 and that level was maintained, with very slight fluctuations, to its end.

The estimate of the Crop Reporting Board, Department of Agriculture, on conditions as of September 1 places the season's yield of American cotton at 14,825,000 bales, a decrease of 718,000 bales or 4.6 per cent from its figures for the same date in August. The indicated yield per acre is 152.2 pounds, or 3.6 per cent below the 10-year average. The primary reason given by the board for the decrease in its estimated production from the figures of August 1 was the unusually hot and dry weather that prevailed in most of the Cotton Belt during the month past. Losses from the continued drought were given as particularly severe in Texas, Mississippi, and Alabama.

Since the government report was compiled, heavy, and in many cases, excessive rains have fallen over all the cotton states. Opinion as to their effectiveness in improving crop conditions seems to be divided.

Material injury to the crop from rain in beating out the cotton and increasing the infestation by weevil is reported. Since the crop is early, ginning is exceptionally advanced, and much of the crop is already made and the rainfall is reported too late for benefit to the southern part of the Cotton Belt.

In the northern sections the breaking of the drought has improved crop conditions, and many others adhere to the conviction that there will be a noteworthy gain in the crop during September, supporting this view by the effects of the Galveston storm of September 8, 1900, that added some 500,000 bales to the previous estimate of the Texas crop. Neither should it be forgotten that after an unfavorable July and worse conditions in August the year 1926 produced a crop of nearly 3,000,000 bales above the government estimate, as a result of improved weather conditions in September.

Report of the National Chamber of Commerce of September 20 announces that American cotton exports for the first half of 1929 have fallen below that of automobiles and accessories. This is due to both an increase in the exports of automobiles and a decrease of 13.9 per cent in the value of exported cotton. The report gives an average price of 19.5 cents paid for the half year against 22.6 cents for the same period a year ago. Though Japan and Canada increased their purchases, Europe's failure to buy to her usual amounts accounts for the heavy loss.

The annual report of the International Association of American Cotton Spinners announces a larger substitution of Indian for American cotton during the past season, than was anticipated. The world's consumption of American cotton is given at 15,076,000 bales.

Since our carry-over for 1929 is placed at 4,450,000 bales, the *Textile World* says,

New York Quotations

September 26, 1929

Drills

38-inch 2.00-yard .....*yard*	$0.16¾ @	
40-inch 3.47-yard	.09⅞ @	
50-inch 1.52-yard	.23 @	
52-inch 1.90-yard	.18½ @	
52-inch 2.20-yard	.16⅓ @	
59-inch 1.85-yard	.19½ @	

Ducks

38-inch 2.00-yard D. F..*yard*	.17½ @	
40-inch 1.45-yard S. F.....	.23½ @	
72-inch 1.05-yard D. F......	.35¼ @	
72-inch 16.66-ounce	.38½ @	
72-inch 17.21-ounce	.40 @	
MECHANICAL		
Hose and belting.....*pound*	.35 @	
TENNIS		
52-inch 1.35-yard ......*yard*	.26 @	

Hollands

R.T.5—30-inch ....*yard*	.16 @	
R.T.7—36-inch	.18 @	
R.T.8—40-inch	.20 @	
48A—32-inch	.12½ @	
48A—40-inch	.15½ @	
RED SEAL		
36-inch	.15½ @	
40-inch	.16½ @	
50-inch	.25 @	
GOLD SEAL		
40-inch, No. 72............	.20¾ @	
40-inch No. 80.	.22 @	

Osnaburgs

40-inch 2.35-yard .....*yard*	$0.14½ @	
40-inch 2.48-yard	.13¾ @	
40-inch 3.00-yard	.11⅓ @	
40-inch 10-oz. part waste.*lb.*	.16¾ @	
40-inch 7-oz.............*lb.*	.12¾ @	
37-inch 2.42-yard......*yard*	.14 @	

Raincoat Fabrics

COTTON		
Bombazine 64 x 60....*yard*	.11 @	
Bombazine 60 x 48........	.10 @	
Plaids 60 x 48............	.12½ @	
Plaids 48 x 48............	.11½ @	
Surface prints 64 x 60....	.13½ @	
Surface prints 60 x 48....	.12½ @	
Print cloth, 38½-in., 60 x 48	.06¾ @	
Print cloth, 38½-in., 64 x 60	.07¾ @	

Sheetings, 40-inch

48 x 48, 2.50-yard.....*yard*	.12⅝ @	
48 x 48, 2.85-yard..........	.11¼ @	
64 x 68, 3.15-yard........	.11¼ @	
56 x 60, 3.60-yard........	.09½ @	
44 x 48, 3.75-yard........	.09¼ @	.09½
44 x 40, 4.25-yard........	.08¼ @	

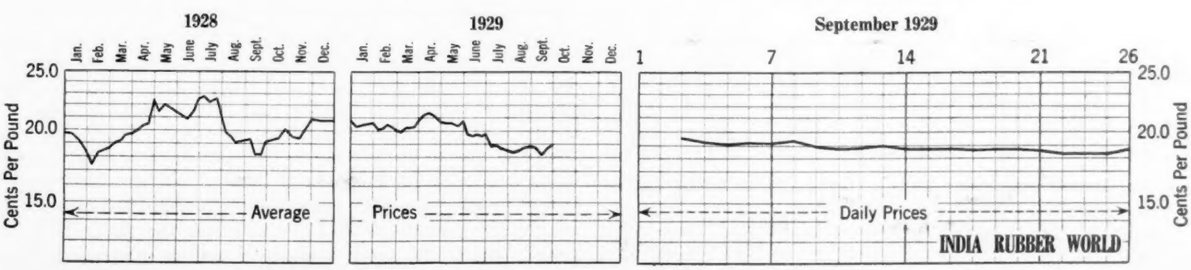
Sheetings, 36-inch

48 x 48, 5.00-yard.....*yard*	.07 @	
44 x 40, 6.15-yard.........	.05⅞ @	.06

Tire Fabrics

SQUARE WOVEN 17¼-ounce		
Peeler, karded........*pound*	$0.47 @	
BUILDER 23/11		
Peeler, karded........*pound*	.47 @	
BUILDER 10/5		
Peeler, karded........*pound*	.44 @	
CORD 23/5/3		
Peeler, karded, 1$\frac{1}{16}$-in..*pound*	.47 @	
CORD 23/4/3		
Peeler, karded........*pound*	.49 @	
CORD 23/3/5		
Peeler, karded........*pound*	.52 @	
CORD 15/3/5		
Peeler, karded........*pound*	.45 @	
CORD 13/3/3		
Peeler, karded........*pound*	.44 @	
LENO BREAKER		
8-oz. Peeler, karded...*pound*	.47 @	
10-oz. Peeler, karded.......	.47 @	
CHAFER		
9.5-oz. Peeler, karded.*pound*	.50 @	
12-oz. Peeler, karded.......	.48 @	
14-oz. Peeler, karded.......	.47 @	

New York Cotton Exchange Daily Prices of Spot Middling Upland Cotton



"It may be questioned whether this points to an average price 20c per pound for the season."

The report of the Association of Cotton and Textile Merchants of New York says, "Carry-over of American cotton can not be safely reduced much further, and consequently consumption during the coming season must be kept within the limits of this year's crop."

The *Journal of Commerce* says, "The carry-over of 4,474,000 bales in 1929 compares with 5,121,000 bales in 1928, 7,794,000 bales in 1927. As to consumption, where water has been once it is apt to go again. If it was 15,179,000 bales last season, it is worth while to recall it was 15,500,000 in 1927 and 15,753,000 in 1926. It is not inconceivable that this season may reach 15,250,000 bales or even more. Meanwhile the spinners are believed to be, in many cases, carrying stocks so scanty as to invite predicament. Some think the mills will become uneasy, sooner or later, with the crop under 15,000,000 bales."

In replies to thirty-three telegrams sent by a private source, on September 10, to correspondents in the cotton states, twenty-two expected a 15,000,000 crop for 1929, seven approved the government estimate, and four believed it too high.

EGYPTIAN COTTON. The basis on all the longer staples has eased somewhat during the past month. There has been a steady small demand from spinners, but no general buying in quantity. In Egypt the crop is at least two weeks late and there is some talk of damage, but a final yield, approximately the same as last year, is expected. All staples are now selling very close to the attractive prices which were obtained during last season's movement, and spinners might do well to bear in mind the advance in basis which occurred last season after the bulk of the crop had left the growers' hands.

Cotton Fabrics

DUCKS, DRILLS, AND OSNABURGS. On these fabrics prices are tightening up. Compared to July and August the demand has improved and there is greater disposition on the part of manufacturers to stand firm on their asking prices. The trade is looking forward to requests for "early delivery" on much of the new fall business, and anticipates increasing difficulty in meeting such demands on other than the ordinary constructions.

RAINCOAT FABRICS. The raincoat trade waited until the last minute to decide what fabrics they would use for their goods. They selected fine wool Jersey in colors to be plied together with a skim coating of rubber, thus giving a double face combination. This construction was considered unsatisfactory. The trade next turned to a napped plaid and encountered the condition that napped goods are made only to order and three or four weeks are required for delivery.

The big selling numbers reported are Jersey cloth, leatherette, and the trench coats. The latter are being made in red, green, blue, and tan.

SHEETINGS. The grey goods market has not been active in all divisions the past month. Prices have remained firm with commission houses showing no disposition to shade prices on any quantities. Deliveries on spots and September on standard prints command a premium of 1/8-cent a yard. The trade looks for a very good inquiry for the balance of the year.

TIRE FABRICS. The market at present is in a quiet condition, due chiefly to the season of the year and the fact that the tire companies overshot the mark by producing earlier in the year more tires than were needed. They are now compensating for this state of affairs by curtailed production. This readjustment affects correspondingly the current demand for tire fabrics.

Cotton in the Rubber Tire and Tube Industry

IN addition to the work being done by the Department of Agriculture and the Cotton-Textile Institute, Inc., in the interest of new and extended uses for cotton, the Department of Commerce is making extensive investigations of industries, arts, trades, and professions for further usefulness of cotton.

A survey[1] has been made of the rubber tire and tube industry, by personal interviews and correspondence with representative tire manufacturers. The fundamental purpose of the study is to ascertain wherein this industry adapts itself to an increased use of cotton products, not only in the tires and tubes, but also in the manufacturing process and plant equipment.

Increase of Cotton Consumption in the Tire Industry

According to statistics compiled by the Rubber Manufacturers Association, Inc., which organization represents approximately 75 per cent of the entire industry, approximately 700,000 bales of cotton were consumed by manufacturers of rubber tires in 1928, as compared with approximately 250,000 bales in 1921, showing an increase of 182 per cent.

The following table shows the number of bales of cotton used in the two types of tire casings manufactured (cord and fabric) for the years 1926, 1927, and 1928:

	Square Woven Fabric Used in Fabric Casings		Square Woven Fabric Used in Cord Casings		Cord Fabric Used in Cord Casings		
	Bales of Cotton	Per Cent of Total	Bales of Cotton	Per Cent of Total	Bales of Cotton	Per Cent of Total	Total Bales of Cotton
1926....	49,501	9.5	33,886	6.5	437,281	84.0	520,668
1927....	12,356	2.2	68,503	12.3	477,509	85.5	558,368
1928....	3,119	0.4	80,882	11.5	618,068	88.1	702,069

It is interesting to note that, according to an authoritative trade estimate, during 1928 the tire and tube industry used approximately 10 per cent in the total production of cotton goods by weight. Although the greatest portion of this quantity is used in cord fabric and fillerless cord fabric, square woven fabrics, sheetings, flannel, osnaburgs, enameling duck, and lenos are also used.

Greater Use of Cotton in the Tire and Manufacturing Equipment

A tire is manufactured entirely of rubber and cotton, with exception of the wire used as beads, indicating that the possibility of the increase in use of cotton lies in the production of tires of greater ply. The data contained in the following table show the average number of pounds of raw cotton and cotton fabrics per tire for the years 1921 to 1928 inclusive.

	1921	1923	1924	1925	1926	1927	1928
Average number of lbs. of cotton fabric per tire	3.66	3.21	3.67	3.69	3.59	3.67	3.82
Average number of lbs. of raw cotton per tire*	4.30	3.71	4.32	4.34	4.22	4.32	4.49
Percentage increase or decrease in cotton consumption per tire (1921—100 per cent)	...	—12.3	+0.3	+0.6	—1.9	+0.3	+4.4

*Based on a 15 per cent loss in spinning.

It is noted from the above table that the amount of cotton per tire varied slightly from year to year, with the exception of the years 1923 and 1928. During 1928, 4.4 per cent more cotton per tire was consumed than in 1921 and approximately 4.0 per cent more than in 1927. This increase, which is the greatest of any noted for the past seven years, may be attributed to the introduction of the so-called "Super Quality" tires and also to an increase in the number of balloon casings being produced for trucks and busses. Of the 71,850,456-pound increase in cotton consumption during 1928 over 1927, 13,291,150 pounds or 26,580 bales was the amount of increase, due to the extra quantity of cotton used per casing.

[1] Data taken from "Cotton in the Rubber Tire and Tube Industry," by Herbert A. Ehrman, Textile Division, Department of Commerce, Washington, D. C.

United States Statistics

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

	June, 1929		Six Months Ended June, 1929	
	Pounds	Value	Pounds	Value
UNMANUFACTURED—*Free*				
Crude rubber	93,326,174	$18,799,307	*719,535,579	*$136,814,929
Liquid latex	368,774	74,973	....	....
Jelutong or Pontianak	1,797,165	248,143	9,800,549	1,306,044
Balata	69,256	26,038	1,089,867	367,117
Gutta percha	171,614	25,612	746,432	134,732
Guayule	324,000	62,808	791,000	158,309
Siak, scrap, and reclaimed	2,325,691	36,607	11,158,551	227,444
Totals	98,382,674	$19,273,488	743,121,978	$139,008,575
Chicle ... *dutiable*	483,936	$236,530	8,248,690	$4,088,116
MANUFACTURED—*Dutiable*				
Belting	761	$2,800	20,795	$13,856
Tires	270	3,421	1,339	23,413
Other rubber manufactures	....	212,673	....	1,120,542
Totals	1,031	$218,894	22,134	$1,157,811

EXPORTS OF FOREIGN MERCHANDISE

	Pounds	Value	Pounds	Value
RUBBER AND MANUFACTURES				
Crude rubber	7,060,135	$1,470,746	45,065,026	$9,686,894
Balata	73,957	38,467	138,611	62,923
Gutta percha, rubber substitutes, and scrap	....	....	75,613	6,598
Rubber manufactures	....	92,768	....	219,316
Totals	7,134,092	$1,601,981	45,279,250	$9,975,731

EXPORTS OF DOMESTIC MERCHANDISE

	June, 1929		Six Months Ended June, 1929	
MANUFACTURED				
Reclaimed	2,153,453	$154,048	15,840,738	$1,110,424
Scrap and old	4,558,164	201,252	26,246,246	1,255,699
Rubberized automobile cloth, *sq. yd.*	181,637	88,796	1,311,575	673,406
Other rubberized piece goods and hospital sheeting, *sq. yd.*	201,342	96,039	1,057,580	468,628
Footwear				
Boots ... *pairs*	116,674	284,867	493,714	1,147,392
Shoes ... *pairs*	142,034	118,269	915,854	725,380
Canvas shoes with rubber soles ... *pairs*	609,637	419,463	3,710,036	2,451,393
Soles ... *doz. pairs*	10,247	28,306	70,818	199,241
Heels ... *doz. pairs*	128,241	84,408	815,147	580,917
Water bottles and fountain syringes ... *number*	26,650	16,335	174,470	116,120
Gloves ... *doz. pairs*	11,239	26,883	55,783	145,078
Other druggists' sundries	....	36,000	....	199,951
Balloons ... *gross*	41,474	49,460	343,957	360,278
Toys and balls	....	17,488	....	96,652
Bathing caps ... *doz.*	16,297	33,708	132,125	281,309
Bands	37,411	20,063	245,029	132,003
Erasers	54,393	32,775	287,163	185,769
Hard rubber goods				
Electrical goods	173,705	19,803	1,243,793	153,206
Other goods	....	46,518	....	240,904
Tires				
Casings, auto ... *number*	208,705	2,612,278	1,576,758	19,162,372
Truck and bus casings, 6 inches and over, *number*	19,662	567,686	153,007	4,247,476
Other automobile casings, *number*	189,043	2,044,592	1,423,751	14,914,896
Tubes, auto ... *number*	142,094	295,395	1,050,958	1,911,357
Other casings and tubes, *number*	30,042	105,104	149,487	474,150
Solid tires for automobiles and motor trucks, *number*	3,942	123,867	26,019	779,909
Others	85,960	16,357	911,440	164,287
Tire accessories	....	128,820	....	865,772
Rubber and friction tape	151,450	45,092	888,001	262,639
Belting	438,644	246,883	2,882,160	1,557,656
Hose	712,730	243,112	4,605,941	1,548,069
Packing	220,755	111,129	1,452,488	636,723
Thread	143,154	145,472	878,553	903,567
Other rubber manufactures	....	219,103	....	1,753,918
Totals	....	$8,679,371	....	$59,706,541

*Liquid latex included.

Crude Rubber Imports by Customs Districts

	*July, 1929		Seven Months Ended *July, 1929	
	Pounds	Value	Pounds	Value
Vermont	2,000	$400	2,000	$400
Massachusetts	2,528,407	489,393	23,979,639	4,502,521
New York	75,494,722	14,979,746	698,530,520	133,675,975
Philadelphia	697,184	145,667	3,517,517	680,010
Maryland	2,555,039	473,411	15,283,263	2,793,560
Los Angeles	10,319,990	1,965,617	46,865,256	9,135,199
San Francisco	127,660	24,037	1,017,582	211,907
Oregon	11,200	2,011	100,800	18,147
Chicago	....	....	17,148	3,430
Colorado	235,800	48,126	2,947,423	601,889
Ohio	7,344,445	1,392,502	26,590,878	4,712,537
Totals	99,316,447	$19,520,910	818,852,026	$156,335,575

*Including latex, dry rubber content.

United Kingdom Statistics

IMPORTS

	July, 1929		Seven Months Ended July, 1929	
	Pounds	Value	Pounds	Value
UNMANUFACTURED				
Crude Rubber				
From—				
Straits Settlements	9,266,200	£414,585	83,876,900	£3,700,992
Federated Malay States	3,147,800	150,757	36,008,800	1,617,360
British India	846,000	38,007	7,070,700	319,571
Ceylon and Dependencies	3,556,500	161,534	20,835,500	958,636
Other Dutch possessions in Indian Seas	2,265,700	103,557	13,795,000	639,007
Dutch East Indies (except other Dutch possessions in Indian Seas)	2,308,600	105,461	15,866,300	716,642
Other countries in East Indies and Pacific not elsewhere specified	239,600	10,899	1,358,100	60,698
Brazil	496,900	22,176	4,396,500	197,545
South and Central America (except Brazil)	....	....	123,400	5,426
West Africa				
French West Africa	....	....	96,400	2,915
Gold Coast	22,800	995	256,200	11,809
Other parts of West Africa	184,400	7,693	1,244,000	52,030
East Africa, including Madagascar	77,400	3,392	504,500	22,397
Other countries	88,900	4,673	942,100	43,202
Totals	22,500,800	£1,023,729	186,374,400	£8,348,230
Gutta percha and balata	150,800	14,194	2,429,600	186,294
Waste and reclaimed rubber	1,005,300	13,041	6,770,400	80,929
Rubber substitutes	9,000	215	54,600	1,389
Totals	23,665,900	£1,051,179	195,629,000	£8,616,842
MANUFACTURED				
*†‡Tires and tubes				
Pneumatic				
Outer covers	....	£33,643	....	£300,500
Inner tubes	....	8,396	....	55,934
Solid tires	....	8,370	....	56,053
Boots and shoes ... *doz. pairs*	113,988	145,978	769,626	959,512
Other rubber manufactures	....	165,927	....	1,178,363
Totals	....	£362,314	....	£2,550,362

EXPORTS

	Pounds	Value	Pounds	Value
UNMANUFACTURED				
Waste and reclaimed rubber	3,972,600	£27,900	20,628,600	£159,527
Rubber substitutes	62,600	1,360	539,800	11,220
Totals	4,035,200	£29,260	21,168,400	£170,747
MANUFACTURED				
‡Tires and tubes				
Pneumatic				
Outer covers	....	£389,298	....	£1,940,972
Inner tubes	....	51,948	....	302,944
Solid tires	....	16,828	....	92,513
Boots and shoes ... *doz. pairs*	32,539	49,016	194,971	296,135
Other rubber manufactures	....	286,602	....	1,734,249
Totals	....	£793,692	....	£4,366,813

EXPORTS—COLONIAL AND FOREIGN

	Pounds	Value	Pounds	Value
UNMANUFACTURED				
Crude Rubber				
To—				
Russia	1,055,200	£46,085	4,491,300	£196,528
Sweden, Norway, and Denmark	207,900	11,132	1,214,700	58,025
Germany	2,029,200	87,263	19,248,800	856,578
Belgium	623,600	26,618	5,261,700	233,330
France	4,827,300	223,051	26,644,200	1,206,623
Spain	20,500	1,149	757,100	35,449
Italy	1,031,000	47,173	5,723,400	271,224
Other European countries	488,300	25,682	3,787,000	178,599
United States	797,800	32,827	7,278,300	301,900
Canada	....	....	2,900	131
Other countries	236,400	12,892	1,343,200	70,273
Totals	11,317,200	£513,872	75,752,600	£3,408,660
Gutta percha and balata	61,300	5,670	612,200	45,093
Waste and reclaimed rubber	4,900	111	142,200	2,266
Rubber substitutes	....	....	4,500	104
Totals	11,383,400	£519,653	76,511,500	£3,456,123
MANUFACTURED				
*‡Tires and tubes				
Pneumatic				
Outer covers	....	£1,399	....	£40,120
Inner tubes	....	662	....	7,731
Solid tires	....	19	....	1,004
Boots and shoes ... *doz. pairs*	869	1,751	9,323	19,699
Other rubber manufactures	....	19,839	....	55,618
Totals	....	£23,670	....	£124,172

*After April 12, 1927, tires and tubes imported with complete vehicles or chassis, or fitted to wheels imported separately, are included under complete vehicles or parts.

†Motor cars, motorcycles, parts and accessories, liable to duty from Sept. 29, 1915, until Aug. 1, 1924, inclusive, and after July 1, 1925. Commercial vehicles, parts and accessories were exempt from duty until Apr. 30, 1926, inclusive, and rubber tires and tubes until Apr. 11, 1927, inclusive.

‡Tires and tubes included prior to Apr. 12, 1927.

Crude Rubber Arrivals at New York as Reported by Importers

Plantations

Aug. 15. By "Washington," Far East.

	Cases
General Rubber Co.	†400

Aug. 16. By "Keelung," Far East.

Robert Badenhop Corp.	512
Bierrie & Co., Inc.	238
General Rubber Co.	133
Littlejohn & Co., Inc.	424
The Meyer & Brown Corp.	802

Aug. 16. By "Malkuta," Far East.

Robert Badenhop Corp.	362
Bierrie & Co., Inc.	280
General Rubber Co.	42
Littlejohn & Co., Inc.	400
Rogers Brown & Crocker Bros., Inc.	890

Aug. 16. By "Salabangka," Far East.

General Rubber Co.	1,783
B. W. Henderson & Co., Inc.	100
Littlejohn & Co., Inc.	807
The Meyer & Brown Corp.	136
H. Muehlstein & Co., Inc.	138
Raw Products Co.	250
Rogers Brown & Crocker Bros., Inc.	704
Rogers Brown & Crocker Bros., Inc.	*102
Chas T. Wilson Co., Inc.	300

Aug. 21. By "Bowes Castle," Far East.

Haldane & Co., Inc.	500

Aug. 21. By "Comliebank," Far East.

H. A. Astlett & Co.	1,718
Robert Badenhop Corp.	633
Bierrie & Co., Inc.	485
General Rubber Co.	1,734
B. W. Henderson & Co., Inc.	1,027
Hood Rubber Co.	*70
Littlejohn & Co., Inc.	2,958
The Meyer & Brown Corp.	485
The Meyer & Brown Corp.	*50
Poel & Kelly, Inc.	35
Raw Products Co.	190
Rogers Brown & Crocker Bros., Inc.	1,301
Rogers Brown & Crocker Bros., Inc.	*390
Chas. T. Wilson Co., Inc.	120

Aug. 21. By "Tydeus," Far East.

H. A. Astlett & Co.	1,572
Robert Badenhop Corp.	24
Bierrie & Co., Inc.	314
General Rubber Co.	2,334
Haldane & Co., Inc.	163
B. W. Henderson & Co., Inc.	50
Hood Rubber Co.	*353
Littlejohn & Co., Inc.	1,473
The Meyer & Brown Corp.	1,625
The Meyer & Brown Corp.	*136
H. Muehlstein & Co., Inc.	2,436
Rogers Brown & Crocker Bros., Inc.	3,837

Aug. 22. By "Javanese Prince," Far East.

H. A. Astlett & Co.	1,300
Robert Badenhop Corp. pkgs.	1,078
Bierrie & Co., Inc.	118
General Rubber Co.	1,975
Haldane & Co., Inc.	360
Hood Rubber Co.	*100
Lavino American & Asiatic Co.	112
Littlejohn & Co., Inc.	1,420
The Meyer & Brown Corp.	945
The Meyer & Brown Corp.	*844
H. Muehlstein & Co., Inc.	965
Poel & Kelly, Inc.	100
Raw Products Co.	80
Rogers Brown & Crocker Bros., Inc.	2,913
Rogers Brown & Crocker Bros., Inc.	*695
Chas. T. Wilson Co., Inc.	435

Aug. 23. By "City of Mobile," Far East.

H. A. Astlett & Co.	1,850
Robert Badenhop Corp. pkgs.	1,310
Bierrie & Co., Inc.	300
General Rubber Co.	947
Haldane & Co., Inc.	570
B. W. Henderson & Co., Inc.	352
Lavino American & Asiatic Co.	300
Littlejohn & Co., Inc.	4,347
The Meyer & Brown Corp.	1,100
The Meyer & Brown Corp.	*435
H. Muehlstein & Co., Inc.	450
Poel & Kelly, Inc.	100
Raw Products Co.	100
Rogers Brown & Crocker Bros., Inc.	650
Chas. T. Wilson Co., Inc.	425

*Arrived at Boston.
†Arrived at Los Angeles.
‡Estimated.

Aug. 24. By "Pres. Harrison," Far East.

	Cases
H. A. Astlett & Co.	2,534
Bierrie & Co., Inc.	905
General Rubber Co.	1,085
Haldane & Co., Inc.	1,000
B. W. Henderson & Co., Inc.	56
Hood Rubber Co.	*50
Lavino American & Asiatic Co.	100
Littlejohn & Co., Inc.	1,845
The Meyer & Brown Corp.	943
Poel & Kelly, Inc.	260
Rogers Brown & Crocker Bros., Inc.	1,620
Rogers Brown & Crocker Bros., Inc.	*250
Chas. T. Wilson Co., Inc.	242

Aug. 25. By "Minnewaska," Far East.

General Rubber Co.	140

Aug. 25. By "Pres. Jefferson," Far East.

H. A. Astlett & Co.	†250
Littlejohn & Co., Inc.	†495

Aug. 26. By "Bolton Castle," Far East.

H. A. Astlett & Co.	2,088
Robert Badenhop Corp. pkgs.	315
General Rubber Co.	4,153
Littlejohn & Co., Inc.	6,425
The Meyer & Brown Corp.	1,200
The Meyer & Brown Corp.	*195
Rogers Brown & Crocker Bros., Inc.	1,883
Chas. T. Wilson Co., Inc.	302

Aug. 26. By "Carmania," Europe.

H. A. Astlett & Co.	105
General Rubber Co.	30
Lavino American & Asiatic Co.	25

Aug. 26. By "Minnewaska," London.

Chas. T. Wilson Co., Inc.	104

Aug. 26. By "Pres. Grant," Far East.

Robert Badenhop Corp.	100

Aug. 26. By "Silvercedar," Far East.

H. A. Astlett & Co.	†165
Robert Badenhop Corp.	†250
General Rubber Co.	†200
Littlejohn & Co., Inc.	†655
The Meyer & Brown Corp.	†555

Aug. 27. By "Goldentide," Far East.

Robert Badenhop Corp.	500
Robert Badenhop Corp.	†500

Aug. 27. By "Ixion," Far East.

Robert Badenhop Corp.	26

Aug. 28. By "Mahronda," Far East.

General Rubber Co.	1,190
Littlejohn & Co., Inc.	56
The Meyer & Brown Corp.	250
H. Muehlstein & Co., Inc.	485
Chas. T. Wilson Co., Inc.	100

Aug. 29. By "City of Oran," Far East.

Bierrie & Co., Inc.	333
General Rubber Co.	322
Littlejohn & Co., Inc.	574
The Meyer & Brown Corp.	280
Chas. T. Wilson Co., Inc.	50

Aug. 30. By "Deli," Far East.

H. A. Astlett & Co.	662
Robert Badenhop Corp.	103
General Rubber Co.	2,416
B. W. Henderson & Co., Inc.	100
Littlejohn & Co., Inc.	749
The Meyer & Brown Corp.	468
The Meyer & Brown Corp.	*135
H. Muehlstein & Co., Inc.	269
Rogers Brown & Crocker Bros., Inc.	199
Chas. T. Wilson Co., Inc.	504

Aug. 30. By "Machaon," Far East.

H. A. Astlett & Co.	3,913
Bierrie & Co., Inc.	257
General Rubber Co.	4,551
Haldane & Co., Inc.	1,501
B. W. Henderson & Co., Inc.	613
Lavino American & Asiatic Co.	125
Littlejohn & Co., Inc.	5,781
The Meyer & Brown Corp.	3,512
H. Muehlstein & Co., Inc.	1,640
Poel & Kelly, Inc.	100
Rogers Brown & Crocker Bros., Inc.	1,296
Chas. T. Wilson Co., Inc.	1,178

Sept. 1. By "Tana," Far East.

H. A. Astlett & Co.	1,894
Robert Badenhop Corp. pkgs.	295
Bierrie & Co., Inc.	240
General Rubber Co.	4,194
Lavino American & Asiatic Co.	22
Littlejohn & Co., Inc.	5,783
The Meyer & Brown Corp.	360

	Cases
H. Muehlstein & Co., Inc.	920
Poel & Kelly, Inc.	280
Rogers Brown & Crocker Bros., Inc.	1,345

Sept. 2. By "Minnesota," London.

Chas. T. Wilson Co., Inc.	230

Sept. 2. By "Scythia," London.

Chas. T. Wilson Co., Inc.	29

Sept. 2. By "Siantar," Far East.

General Rubber Co.	‡800

Sept. 3. By "Fairfield City," Far East.

H. A. Astlett & Co.	2,597
Robert Badenhop Corp.	532
General Rubber Co.	3,172
Littlejohn & Co., Inc.	2,945
The Meyer & Brown Corp.	769
The Meyer & Brown Corp.	*398
H. Muehlstein & Co., Inc.	215
Poel & Kelly, Inc.	680
Rogers Brown & Crocker Bros., Inc.	1,805
Rogers Brown & Crocker Bros., Inc.	*130
Chas. T. Wilson Co., Inc.	560

Sept. 3. By "Pres. Johnson," Far East.

H. A. Astlett & Co.	1,244
Robert Badenhop Corp. pkgs.	415
Bierrie & Co., Inc.	474
General Rubber Co.	1,777
Hood Rubber Co.	*292
Littlejohn & Co., Inc.	3,601
The Meyer & Brown Corp.	870
H. Muehlstein & Co., Inc.	468
Poel & Kelly, Inc.	755
Rogers Brown & Crocker Bros., Inc.	1,685
Rogers Brown & Crocker Bros., Inc.	*500
Chas. T. Wilson Co., Inc.	692

Sept. 3. By "Saporea," Far East.

General Rubber Co.	†156
H. Muehlstein & Co., Inc.	†920

Sept. 5. By "Boniface," Far East.

B. W. Henderson & Co., Inc.	31

Sept. 6. By "Larchbank," Far East.

H. A. Astlett & Co.	1,887
Robert Badenhop Corp. pkgs.	688
General Rubber Co.	1,878
Hood Rubber Co.	67
Littlejohn & Co., Inc.	1,043
The Meyer & Brown Corp.	642
H. Muehlstein & Co., Inc.	475
Raw Products Co.	50
Rogers Brown & Crocker Bros., Inc.	1,092
Rogers Brown & Crocker Bros., Inc.	*335

Sept. 6. By "Tai Yang," Far East.

H. A. Astlett & Co.	1,830
Robert Badenhop Corp. pkgs.	1,599
Bierrie & Co., Inc.	695
General Rubber Co.	2,412
Lavino American & Asiatic Co.	200
Littlejohn & Co., Inc.	6,469
The Meyer & Brown Corp.	1,800
The Meyer & Brown Corp.	*210
H. Muehlstein & Co., Inc.	920
Poel & Kelly, Inc.	160
Raw Products Co.	180
Rogers Brown & Crocker Bros., Inc.	1,845
Chas. T. Wilson Co., Inc.	572

Sept. 8. By "Pres. Lincoln," Far East.

Littlejohn & Co., Inc.	†559
The Meyer & Brown Corp.	†165
Rogers Brown & Crocker Bros., Inc.	†325

Sept. 9. By "British Prince," Far East.

H. A. Astlett & Co.	2,580
Robert Badenhop Corp. pkgs.	925
Bierrie & Co., Inc.	483
General Rubber Co.	4,227
Hood Rubber Co.	1,781
Littlejohn & Co., Inc.	5,611
The Meyer & Brown Corp.	1,786
The Meyer & Brown Corp.	*314
Poel & Kelly, Inc.	459
Rogers Brown & Crocker Bros., Inc.	1,078
Chas. T. Wilson Co., Inc.	1,229

Sept. 9. By "Minnetonka," London

H. A. Astlett & Co.	120
Littlejohn & Co., Inc.	378

Sept. 9. By "Steel Ranger," Far East.

General Rubber Co.	46
H. Muehlstein & Co., Inc.	1,092

Sept. 13. By "Silverbeech," Far East.

The Meyer & Brown Corp.	*405

Sept. 13. By "Silverguava," Far East.

H. A. Astlett & Co.	1,320
Robert Badenhop Corp. pkgs.	694
Bierrie & Co., Inc.	483
General Rubber Co.	‡1,755
Hood Rubber Co.	130
Lavino American & Asiatic Co.	52
Littlejohn & Co., Inc.	1,289
The Meyer & Brown Corp.	1,335
H. Muehlstein & Co., Inc.	1,827
Poel & Kelly, Inc.	1,605
Raw Products Co.	50

	Cases
Rogers Brown & Crocker Bros., Inc.	883
Chas. T. Wilson Co., Inc.	1,696
Sept. 15. By "Boschdyk," Far East.	
H. A. Astlett & Co.	560
Robert Badenhop Corp. pkgs.	196
Littlejohn & Co., Inc.	68
Poel & Kelly, Inc.	50
Raw Products Co.	330
Rogers Brown & Crocker Bros, Inc.	245
Chas. T. Wilson Co., Inc.	299

Africans

Sept. 7. By "Veendam," Hamburg.	
Poel & Kelly, Inc.	36
Sept. 9. By "Carinthia," Europe.	
Littlejohn & Co., Inc.	10

Balata

	Cases
Aug. 25. By "Aidan," South America	
Paul Bertuch & Co., Inc.	136
General Rubber Co.	1

Guayule

Aug 27. By "El Coston," Mexico.	
Continental Rubber Co of N. Y.	560
Sept. 3. By "El Norte," Mexico.	
Continental Rubber Co. of N. Y.	560
Sept. 6. By "El Oriente." Mexico.	
Continental Rubber Co. of N. Y.	560
Sept. 14. By "El Alba." Mexico.	
Continental Rubber Co. of N. Y.	560

Rubber Latex

	Gallons
Aug. 16. By "Salabangka," Far East.	
General Rubber Co.	gals. 29,314
Aug. 21. By "Comliebank," Far East.	
Littlejohn & Co., Inc.	gals. 1,000
Aug. 26. By "Bolton Castle," Far East.	
General Rubber Co.	gals. 43,417
Sept. 3. By "Fairfield City," Far East.	
General Rubber Co.	gals. 64,157
Sept. 13. By "Silverguava," Far East.	
General Rubber Co.	gals. 142,973

Paras and Caucho

	Fine Cases	Medium Cases	Coarse Cases	Caucho Cases	Miscel. Cases
Aug. 25. By "Aidan" South America.					
H. A. Astlett & Co.	250	4	41	298	....
Paul Bertuch & Co., Inc.	320	....	....	....	....
General Rubber Co.	31	2	7	....	*2
Littlejohn & Co., Inc.	178	....	....	....	....
The Meyer & Brown Corp.	50	....	....	....	....

*Mixed

	Fine Cases	Medium Cases	Coarse Cases	Caucho Cases	Miscel. Cases
Aug. 29. By "Berury," South America.					
H. A. Astlett & Co.	106	....	110	146	....
Sept. 2. By "Basil," South America.					
H. A. Astlett & Co.	....	....	....	80	....
Sept. 3. By "Boniface," South America.					
H. A. Astlett & Co.	319	....	80	167	....
Sept. 11. By "Western World," South America.					
Paul Bertuch & Co., Inc.	125	....	10	....	....

United States Crude and Waste Rubber Imports for 1929 by Months

	Plantations	Paras	Africans	Centrals	Guayule	Manicobas and Matto Grosso	Total 1929	Total 1928	Balata	Miscellaneous	Waste
January ... tons	51,202	1,055	30	5	....	13	52,305	46,243	67	799	181
February	63,851	530	60	97	....	..	64,538	29,445	80	1,220	319
March	51,661	2,112	15	36	....	..	53,824	40,894	85	825	70
April	53,256	844	8	4	59	..	54,171	37,240	87	1,606	609
May	47,940	1,078	54	49	59	..	49,180	32,883	88	1,013	230
June	43,313	1,032	44	1	100	..	44,490	25,792	91	1,323	215
July	43,130	931	..	57	134	..	44,252	33,382	75	1,044	274
August	37,572	572	5	9	134	..	38,292	29,805	102	1,031	166
Total eight months, 1929 ... tons	391,925	8,154	216	258	486	13	401,052	......	675	8,861	2,064
Total eight months, 1928 ... tons	262,700	8,365	800	454	3,364	1	......	275,684	789	6,758	1,965

Compiled from Rubber Manufacturers Association statistics.

Ceylon Rubber Exports

January 1 to June 30, 1929

	Tons
To United Kingdom	7,303.63
Continent	3,800.79
Australia	1,826.21
America	24,883.33
Egypt	5.00
Africa	4.72
India	25.21
Japan	167.70
Other countries in Asia	5.07
Total	38,021.66
For the same period last year	21,905.12

Annual Exports, 1921-1928

	Tons
For the year 1928	57,825.48
1927	55,355.77
1926	58,799.56
1925	45,697.19
1924	37,351.13
1923	37,111.88
1922	47,367.14
1921	40,210.31

London Stocks, July, 1929

London	Landed for July Tons	Delivered for July Tons	Stocked July 31 1929 Tons	1928 Tons	1927 Tons
Plantation	5,924	6,852	29,947	35,314	63,528
Other grades	.....	12	64	84	122
Liverpool					
Plantation	†1,263	†1,152	†4,661	†2,389	†3,059
Total tons, London and Liverpool	7,187	8,016	34,672	37,787	66,709

Official returns from the recognized public warehouses.

British Malaya

RUBBER EXPORTS

An official cable from Singapore to the Malayan Information Agency, Malaya House, 57 Charing Cross, London, S. W. 1, England, states that the amount of rubber exported from British Malaya in August, 1929, totaled 50,441 tons, as compared with 46,454 tons in July last, and 35,593 tons in the corresponding period of 1928. The amount of rubber imported was 15,469 tons, of which 11,759 tons were declared as wet rubber. The following are comparative statistics:

	1928 Gross Exports Tons	1928 Foreign Imports Tons	1929 Gross Exports Tons	1929 Foreign Imports Tons
January	27,731	16,618	52,546	13,415
February	28,813	12,911	47,926	12,103
March	27,813	10,508	49,448	14,553
April	20,029	9,335	49,816	11,414
May	26,403	10,350	43,960	15,593
June	22,930	16,168	40,398	14,344
July	30,405	13,283	46,454	15,071
August	35,593	15,114	50,441	15,469
Totals	219,717	104,387	380,989	111,962

The above figures represent the totals compiled from declarations received up to the last day of the month for export from and import to all ports of British Malaya, and not necessarily the actual quantity shipped or landed during that month.

DISTRIBUTION

The following is a comparative return of distribution of shipments during the months of July and August:

	July, 1929 Tons	August, 1929 Tons
United Kingdom	11,734	15,017
United States	26,108	24,584
Continent of Europe	4,779	5,582
British Possessions	783	1,336
Japan	2,972	3,865
Other foreign countries	78	57
Totals	46,454	50,441

World Rubber Absorption—Net Imports

	Total 1928	Long Tons—1929 Mar.	Apr.	May	June	July
Australia	8,430	725	1,518	1,437	2,215	2,918
Belgium	7,958	931	750	854	672	1,039
Canada	30,447	4,961	3,177	2,937	3,075	3,205
Czechoslovakia	3,138	409	445	277	420	....
Denmark	566	60	62	57	74	97
Finland	768	5	104	101	86	100
France	36,498	4,409	4,854	3,152	6,814	1,967
Germany	37,855	4,586	5,351	3,682	3,948	3,559
Italy	12,433	1,515	1,407	1,417	1,624	2,023
Japan	25,621	2,630	2,308	2,314	1,593	....
Netherlands	2,243	316	144	201	687	253
Norway	728	55	63	73	61	58
Russia	15,134	716	703	*700	*700	....
Spain	3,178	80	40	37	24	....
Sweden	2,356	234	727	237	286	264
United Kingdom	4,846	9,068	8,295	5,112	5,361	4,993
United States	404,496	46,391	52,447	48,350	38,676	40,914
U. S. (Guayule)	3,076	—	83	125	145	200
Totals	599,771	77,091	82,478	71,063	66,461	....

* Estimated.
Compiled by Rubber Division, Department of Commerce, Washington, D. C.

Low and High New York Spot Prices

	September 1929*		1928		1927	
PLANTATIONS						
First latex crepe	$0.21	@$0.21⅝	$0.18½	@$0.19½	$0.33	@$0.34⅜
Smoked sheet, ribbed	.20	@ .20⅝	.17¾	@ .19	.33	@ .34¼
PARAS						
Upriver, fine	.20⅜	@ .21	.18¾	@ .21	.28¼	@ .30
Upriver, coarse	.10⅜	@ .11	.12¾	@ .14	.19	@ .20
Islands, fine	....	@	.17	@ .19	.26	@ .26¾

*Figured to September 25, 1929.

Tire Production Statistics

High Pressure Pneumatic Casings

	All Types In-ventory	Pro-duction	Total Shipments	Cord In-ventory	Pro-duction	Total Shipments
1928	....	58,457,863	55,721,937	....	19,302,218	19,351,380
1929						
January	10,284,158	5,041,530	4,969,647	3,651,041	1,563,554	1,461,104
February	11,620,960	5,183,693	3,961,751	4,073,644	1,373,691	974,185
March	12,263,816	5,639,426	5,031,101	4,330,747	1,397,657	1,157,188
April	12,696,808	5,912,854	5,470,779	4,292,167	1,305,224	1,335,121
May	13,386,440	6,109,026	5,388,291	4,285,674	1,371,987	1,356,529
June	13,467,567	5,477,771	5,440,693	3,956,799	1,249,596	1,594,201
July	11,872,330	4,856,241	5,891,020	3,325,494	1,162,182	1,690,264

	Balloon Casings In-ventory	Pro-duction	Total Shipments	Solid and Cushion Tires In-ventory	Pro-duction	Total Shipments
1928	....	38,878,218	35,931,982	....	508,223	512,602
1929						
January	6,583,958	3,470,596	3,499,121	149,240	31,583	33,051
February	7,472,592	3,796,660	2,976,698	145,811	29,747	31,463
March	7,858,642	4,229,586	3,863,650	141,902	35,441	40,205
April	8,346,727	4,601,986	4,123,769	137,613	38,419	43,130
May	9,047,376	4,732,416	4,022,910	133,654	39,611	42,414
June	9,471,532	4,223,335	3,829,506	131,633	39,741	40,355
July	8,515,634	3,689,616	4,192,894	127,653	38,470	40,781

	High Pressure Inner Tubes In-ventory	Pro-duction	Total Shipments	Balloon Inner Tubes In-ventory	Pro-duction	Total Shipments
1928	....	23,255,891	23,749,966	....	36,878,990	34,095,223
1929						
January	4,734,477	1,540,272	1,800,676	6,805,018	3,347,660	3,630,579
February	5,159,171	1,398,156	1,046,042	7,572,752	3,675,116	2,908,406
March	5,356,289	1,475,822	1,276,490	7,938,587	4,120,493	3,773,585
April	5,220,167	1,347,128	1,447,504	8,369,244	4,375,920	3,921,768
May	5,017,011	1,155,013	1,480,293	9,167,038	4,586,606	3,795,350
June	4,384,077	1,177,147	1,698,896	9,654,688	4,049,173	3,510,947
July	3,540,819	1,382,118	2,135,297	8,692,058	3,249,014	3,945,727

	Cotton and Rubber Consumption Casings, Tubes, Solid and Cushion Tires: Cotton Fabric Pounds	Crude Rubber Pounds
1928	222,243,398	600,423,401
1929		
January	19,779,481	54,160,529
February	20,326,530	57,558,636
March	21,238,410	61,335,423
April	23,619,687	65,673,453
May	23,302,120	66,028,029
June	20,358,937	56,861,320
July	18,125,761	52,249,004

Rubber Manufacturers Association figures representing 75 per cent of the industry.

World Rubber Production—Net Exports

British Malaya:	Total 1928	Long Tons—1929 Mar.	Apr.	May	June	July	Aug.
Gross exports	409,500	49,448	49,816	43,960	40,398	46,454	50,441
Imports	149,787	14,553	11,414	15,593	14,344	15,071	15,469
Net	259,713	34,895	38,402	28,367	26,054	31,383	34,972
Ceylon	57,267	6,713	4,676	4,850	6,051	5,746	5,564
India and Burma	10,790	1,413	727	800	*1,000	974	.....
Sarawak	10,087	758	747	966	1,061	1,247	993
B. N. Borneo	6,698	*500	*500	*500	*500	*500	*500
Siam	4,813	499	306	453	422	462	431
Java and Madura	58,848	5,515	5,997	6,264	5,582	6,422	.....
Sumatra E. Coast	82,511	6,620	6,645	6,961	6,693	7,192	.....
Other N. E. Indies	121,671	10,629	11,321	13,437	11,270	13,995	.....
French Indo-China	9,616	741	568	650	608	555	545
Amazon Valley	21,129	2,332	1,950	1,922	1,398	1,457	1,563
Other America	1,490	155	57	64	5	.....	.....
Mexican Guayule	3,076	—	83	125	145	200	.....
Africa	6,124	631	429	544	*500	.....	.....
Totals	653,833	71,401	72,408	65,903	61,289	.....	.....

* Estimated.
Compiled by Rubber Division, Department of Commerce, Washington, D. C.

World Rubber Stocks

Producing Centers	Long Tons—1929 Mar.	Apr.	May	June	July	Aug.
Singapore	25,326	23,202	26,764	25,641	28,950	26,496
Penang	4,111	4,137	5,168	6,220	6,523	6,628
Para	3,518	3,392	3,310	4,475	3,658	3,678
Totals	32,955	30,731	35,242	36,336	39,131	36,802
Manufacturing Centers						
London	28,214	31,368	31,290	30,982	30,937	35,605
Liverpool	4,326	4,590	4,538	4,628	4,662	7,560
Amsterdam	944	931	1,315	1,560	1,569	....
United States	100,537	107,659	97,192	92,062	95,536	....
Plantation Afloat*	95,700	91,200	83,290	80,020	83,412	....
Totals	229,721	235,748	217,625	209,252	216,116	....
Grand totals	262,676	266,479	252,867	245,588	255,247	....

*W. H. Rickinson & Son. *The World's Rubber Position.*
Compiled by Rubber Division, Department of Commerce, Washington, D. C.

Netherlands East Indies Exports

	Total Jan.-Apr. 1928	Total Jan.-Apr. 1929	Long Tons—1929 Feb.	Mar.	Apr.	May
Java and Madura	16,941	23,724	6,572	5,515	5,997	6,264
Sumatra East Coast	25,913	28,843	7,511	6,620	6,645	6,961
Other N. E. I.*						
Atjeh	1,279	1,492	338	343	395	302
Riouw	2,686	3,538	822	797	821	1,016
Djambi	9,515	9,586	2,012	2,314	2,617	3,072
Palembang	5,211	7,368	2,038	1,968	1,413	2,581
Lampongs	933	1,056	321	230	275	317
Benkoelen	15	16	3	4	6	5
Sumatra West Coast	510	452	132	102	95	135
Tapanoeli	1,783	2,219	612	539	526	634
Banka	285	279	46	126	31	217
Billiton	37	35	4	14	6	21
W. Coast Borneo	5,272	8,499	1,965	2,027	2,429	2,771
S. and E. Borneo	7,993	9,365	2,219	2,200	2,594	2,500
Menado	67	62	17	24	18	12
Celebes	16	31	7	12	66	8
Amboino	13	11	4	1	5	1
Totals	35,615	44,009	10,540	10,701	11,297	13,692
Grand totals	78,469	96,576	24,623	22,836	23,939	26,917

*Including shipments of wet native rubber from which a deduction of approximately 33⅓ per cent must be made in order to reduce to a dry basis.
Compiled by Rubber Division, Department of Commerce, Washington, D. C.

Plantation Rubber Exports from Malaya*

	January 1 to June 30, 1929: From Singapore Tons	From Penang Tons	From Malacca Tons
To United Kingdom	3,296.00	5,399.00	4,641.00
British Possessions	2,770.00	701.00	235.00
Continent of Europe	13,370.00	2,922.00	3,618.00
United States	96,924.00	27,135.00	11,294.00
Japan	7,729.00	20.00	369.00
Other countries	576.00	82.00	10.00
Totals	124,665.00	36,259.00	20,167.00

*Excluding all foreign transhipments.